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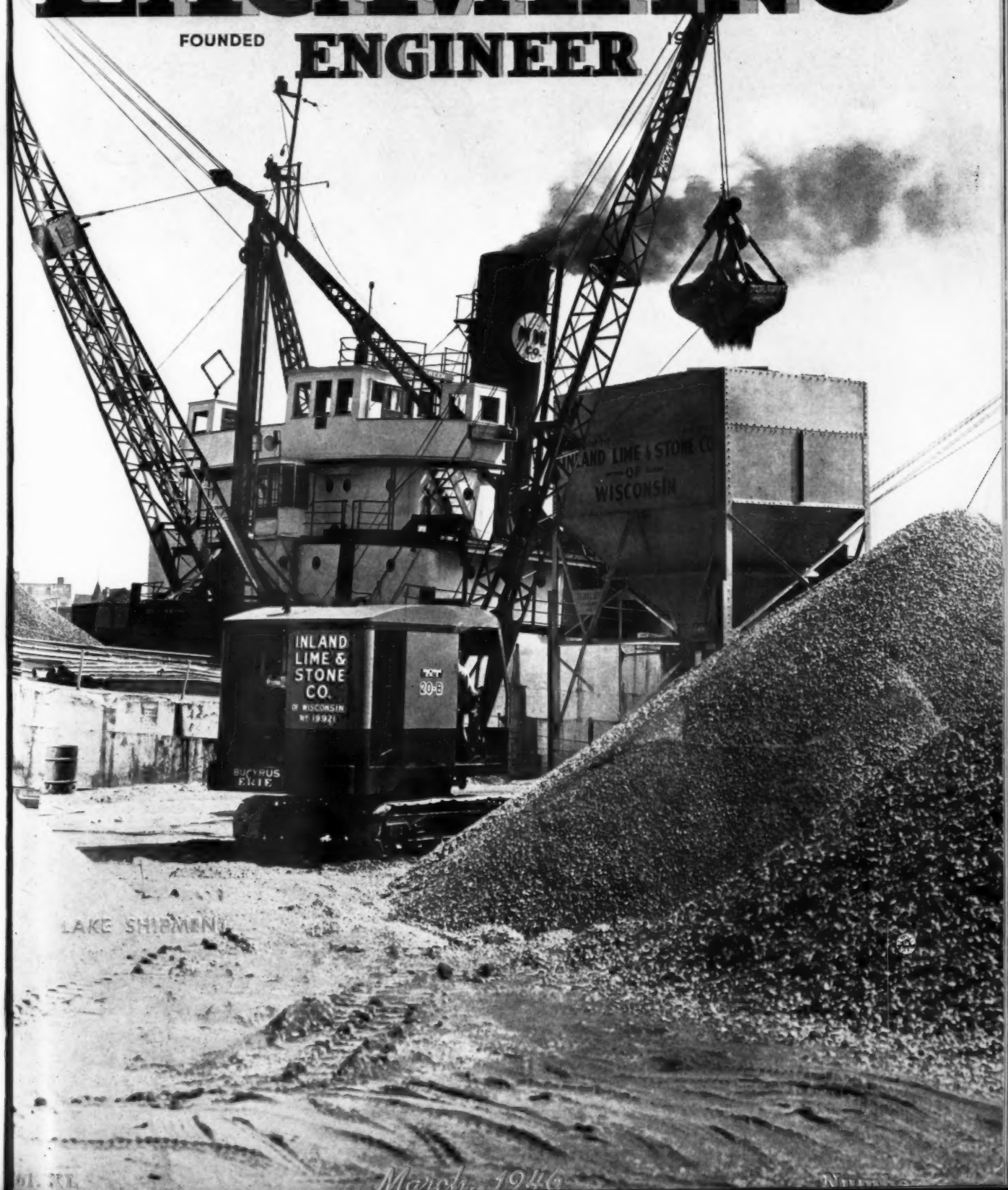
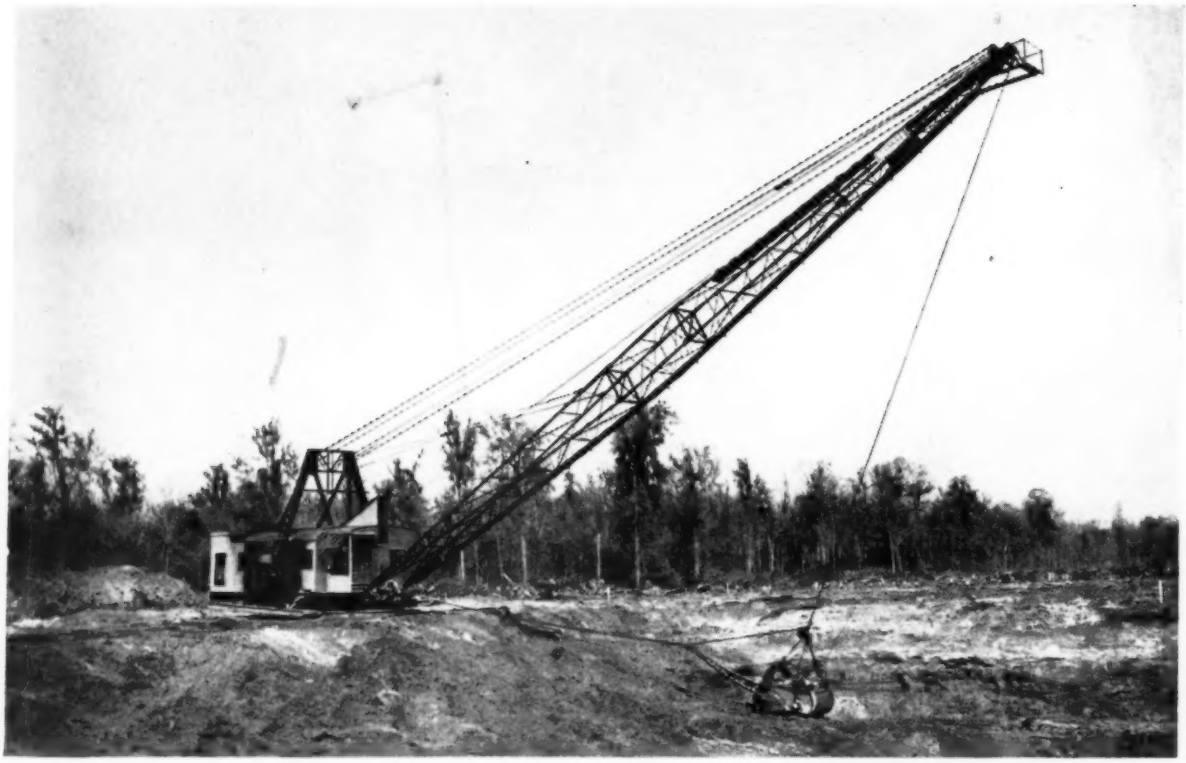


Vol. XL

March, 1946

Number



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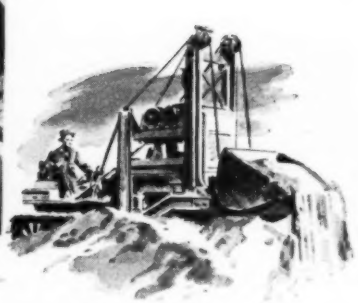

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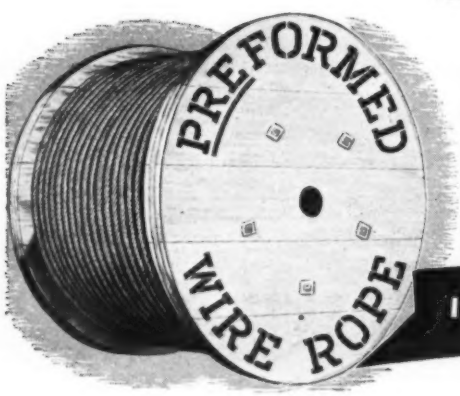

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EXCAVATING ENGINEER

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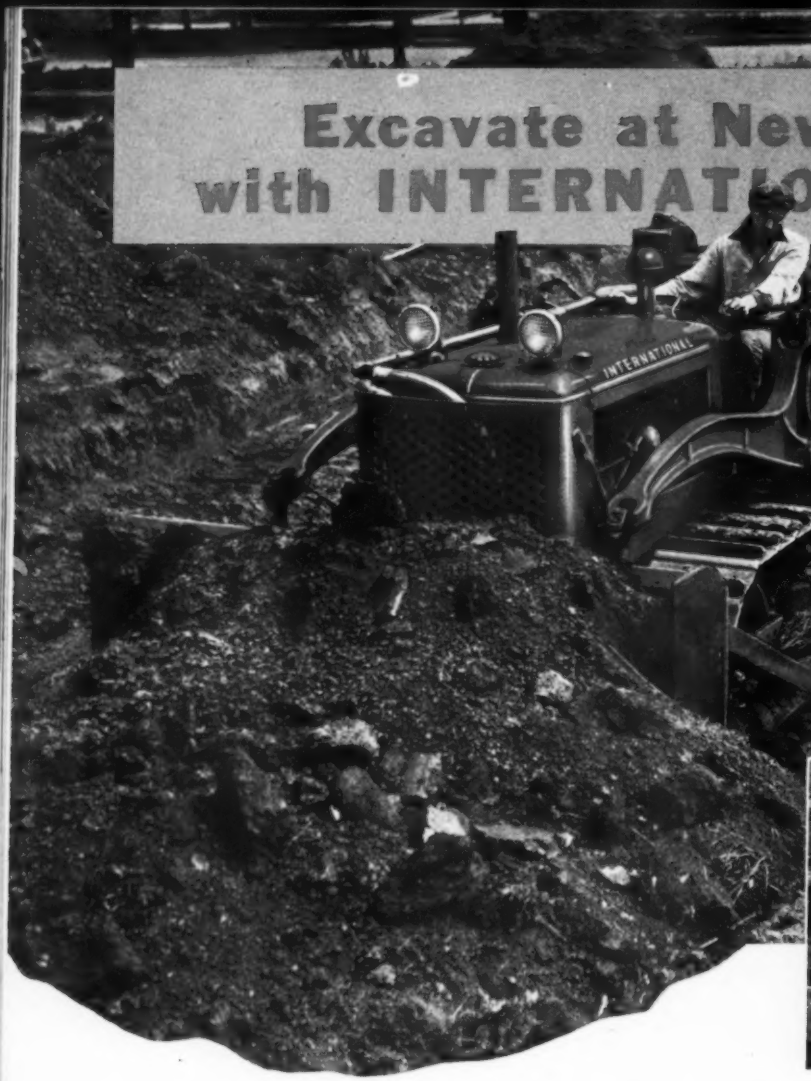

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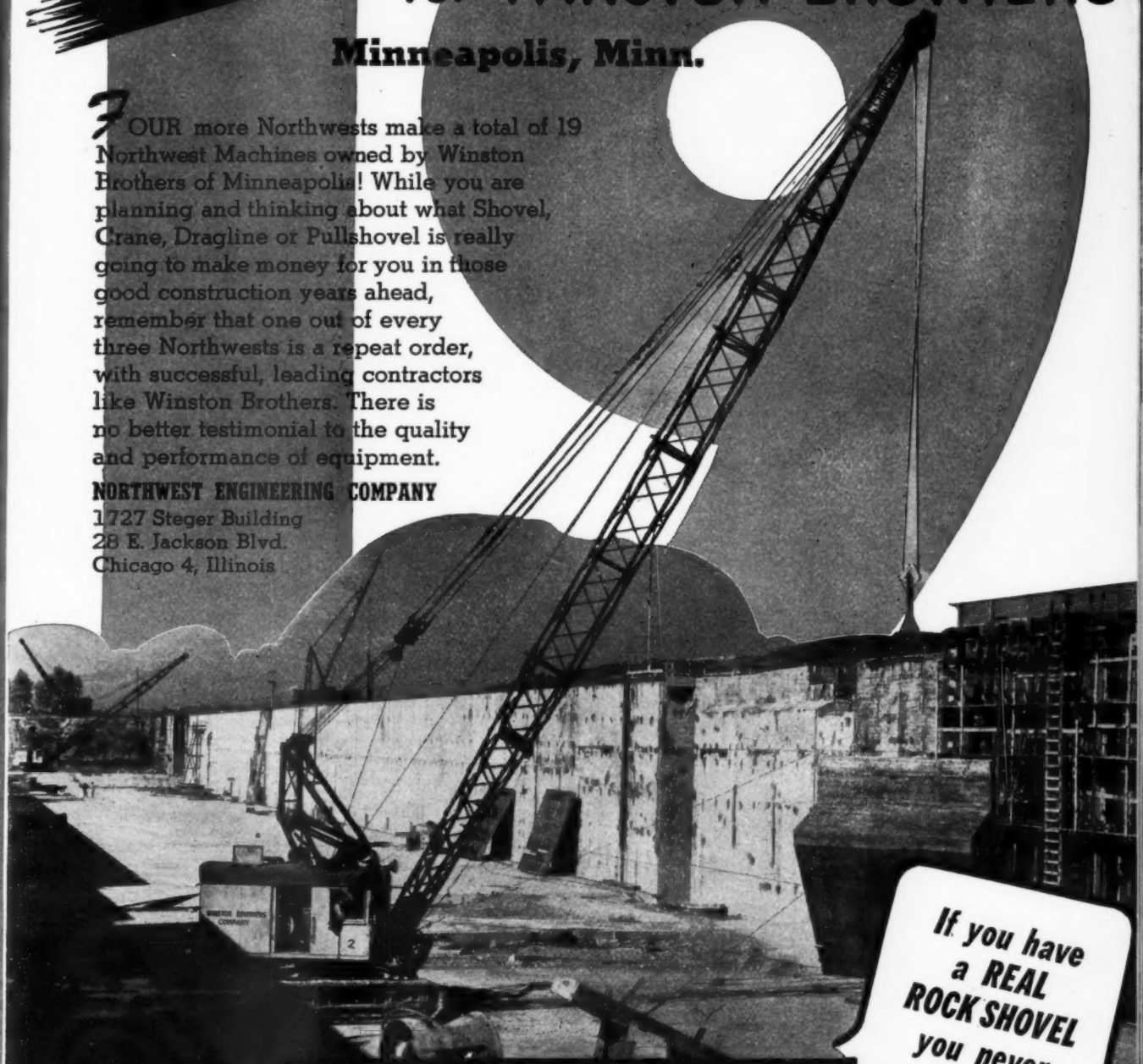

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In the spring, the B-G Bucket Loader is used in conjunction with a blade grader and truck for shoulder clean-up, curve widening, contouring, etc. In the summer, it handles aggregates for asphalt patching, street graveling, etc. In the fall, as winter approaches, it is ideal for handling cinders and sand.

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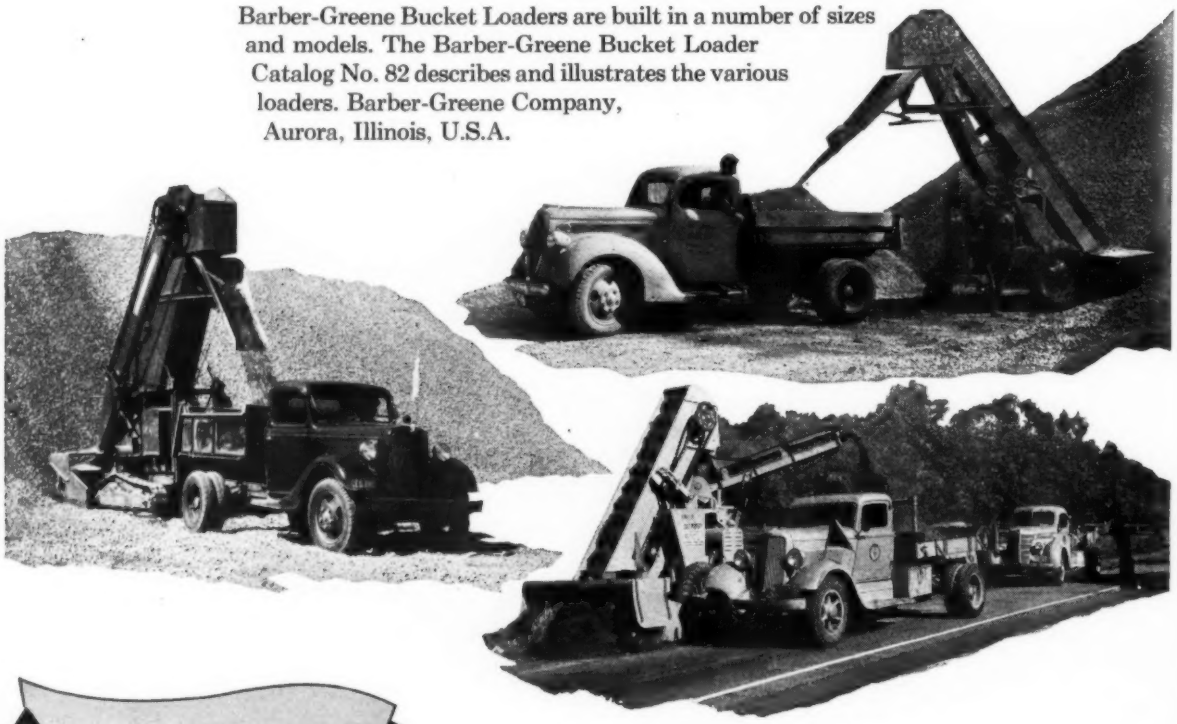
Barber-Greene Bucket Loaders are built in a number of sizes and models. The Barber-Greene Bucket Loader Catalog No. 82 describes and illustrates the various loaders. Barber-Greene Company, Aurora, Illinois, U.S.A.



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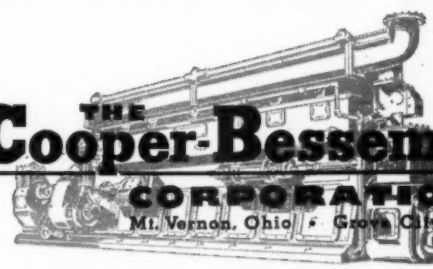

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for wet feet

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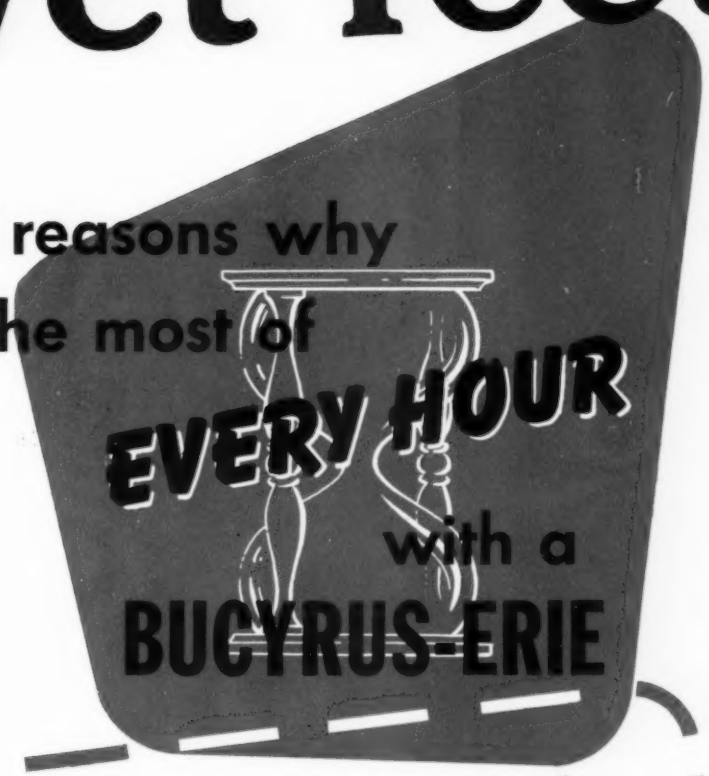
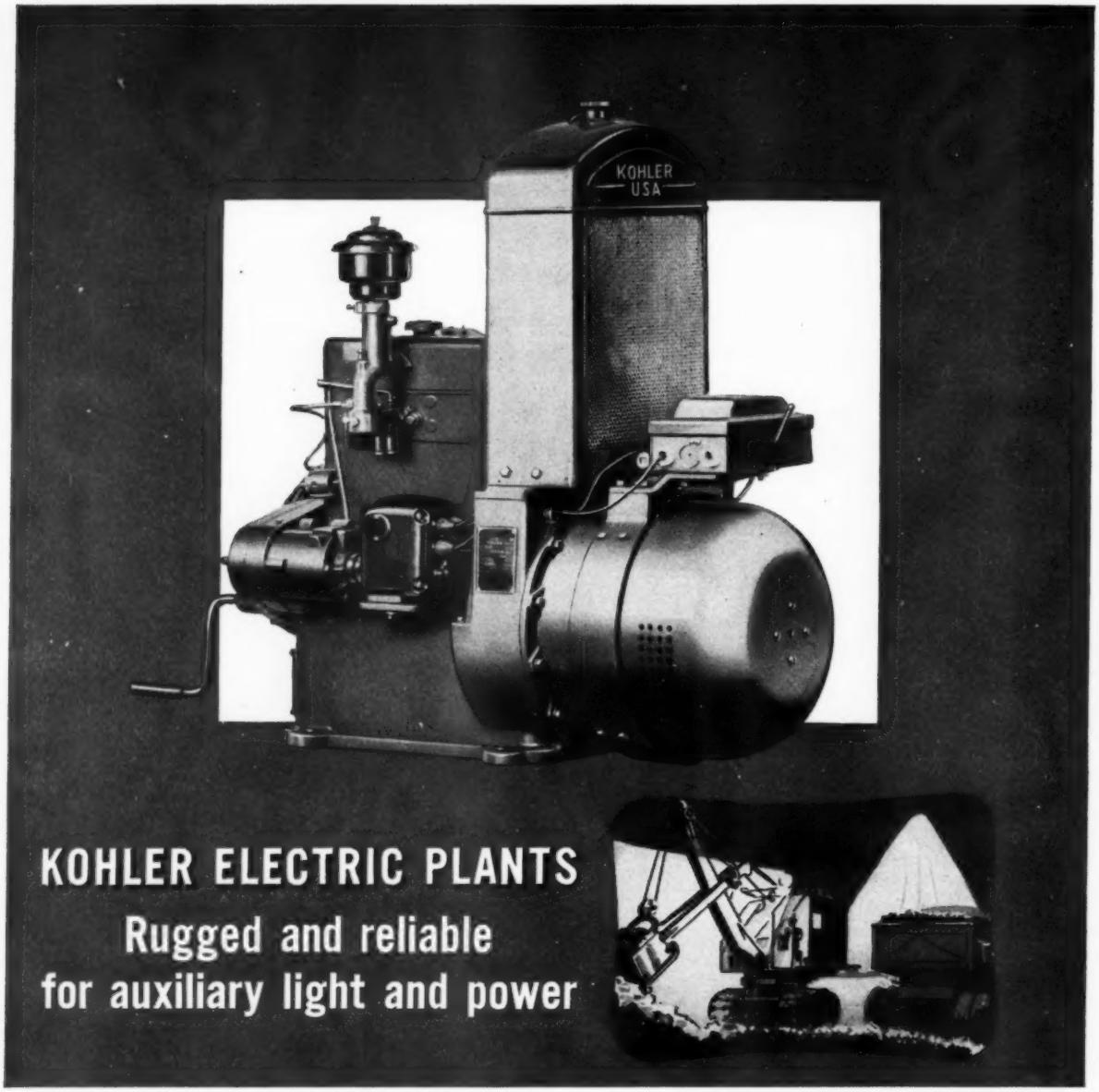


1. All adjustments are easily made and lasting.
2. Parts are simple, large, few in number and enduringly aligned—there's little to go wrong.
3. Machinery is accessible for quick, easy repairs, parts replacement, and lubrication.
4. The digging cycle is balanced, coordinated, fast. There's no overstressing of parts to cause too-frequent adjustments and repairs.
5. All controls are conveniently grouped in one place—no hopping about the machine to cause digging delays.
6. Performance is smooth, quiet—easy on both machine and operator.
7. Design is individual—each machine is especially fitted to its range of work.
8. Moves are fast, sure. Machine is easily steered, makes sharp or gradual turns, climbs grades to 30%.

BUCYRUS ERIE



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*Memphis, Vicksburg and New Orleans districts.

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Fast loading of hauling equipment . . . makes shallow cuts to 9'6" wide . . . maximum cutting depth of 24" . . . the 54" belt is powered by 150 h.p. engine.

EUCLIDS *Move the Earth*

FLOOD CONTROL in San Bernardino Valley

By Mark McMillin

Lytle Creek and Cajon Creek Flood Control Project, designed to divert flood waters from populated areas of San Bernardino Valley, is divided into upper portion, consisting of building levees and groins and by-pass, and lower portion consisting of construction of concrete channel, intake and outlet structures. Over 1,875,000 cu. yds. of excavation of all classes is involved in upper portion and 1,750,000 cu. yds. of excavation in lower portion of project.

SINCE THE GREAT FLOOD of 1865, the broad San Bernardino Valley of Southern California has had no fewer than 12 highly disastrous floods. This susceptibility to floods is due to the valley being surrounded by high mountains and foothills, the drainage from which flows into two small streams, Lytle Creek and Cajon Creek, which in turn empty into the Santa Ana River.

The floods of 1914, 1916, and 1927, were particularly heavy, while those of March, 1938, and January, 1943, were so general and so destructive to both life and property, that valley residents finally decided to take steps to curtail such floods in the future. In 1938, the San Bernardino County Flood Control District was organized.

The San Bernardino County Flood Control District is unique in that it divides the county—the largest in the United States— into six separate zones. Each zone has its own advisory committee, and each proposes and pays for its own particular flood-control needs. Ralph W. Motherspaw, civil engineer, is superintendent of construction, County Surveyor Howard L. Way, chief engineer, and R. V. Ward, assistant engineer, of the district.

The officers went to work immediately after organization was completed. They contacted the District Engineer, Los Angeles, U. S. Engineer Department. As a result, the engineers made a thorough survey of the damages caused by the Flood of 1938. Again, five years later, the U. S. Engineers made a survey of the Flood of 1943.

These surveys showed that these two floods alone caused several million dollars' worth of damage to public and private property, and had also seriously interrupted the usually heavy valley traffic on highways and railroads, so that the valley was practically isolated from the outside world for many hours. In addition, the floods caused considerable loss of life.

The greatest disaster was the Flood of January, 1943. This occurred at the time when the highways and railroads were heavily congested with Army and Navy materiel being sent into the Pacific War Theatre. Within a period of two weeks railroad trestles and fills were washed out, tracks and yards were buried in silt, and many freight cars were overturned and rendered temporarily useless. Traffic on three main transcontinental railroads was

• Lytle Creek Channel with backfilling operations behind completed channel walls in upper left. Equipment in foreground is leveling area around channel.

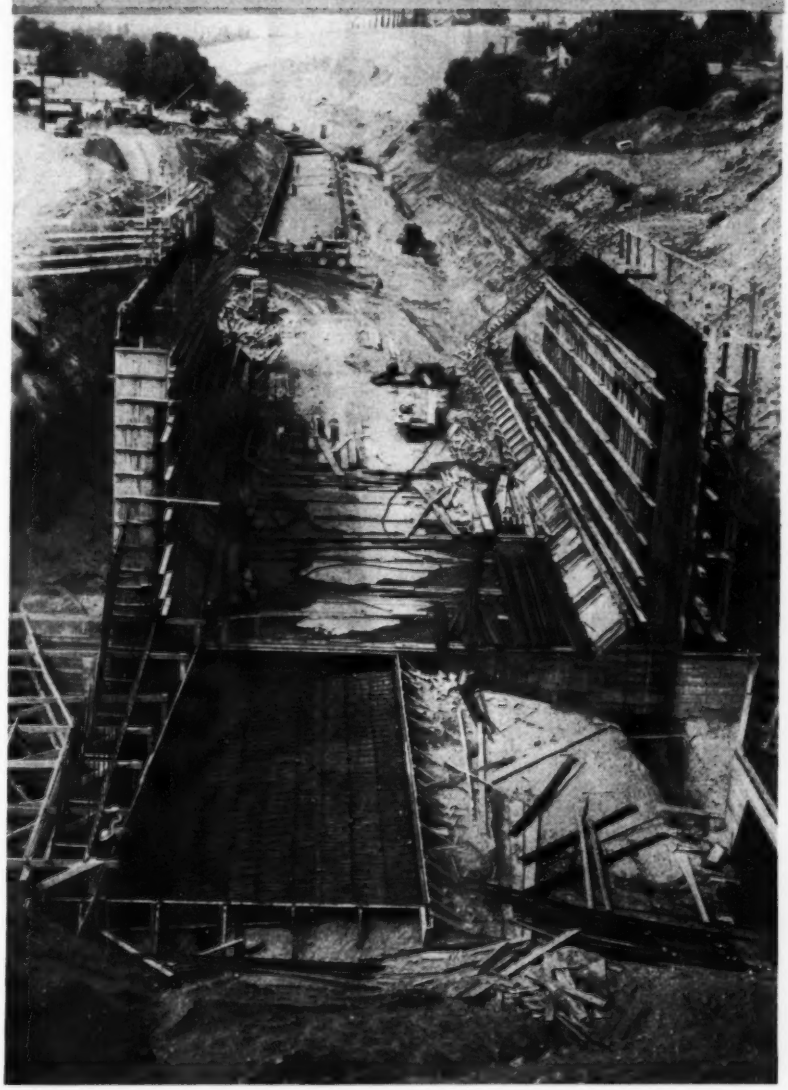
suspended for 58 hours, with the result that the Union Pacific, Atchison, Topeka and Santa Fe, and Pacific Electric lines were at a complete standstill for this period.

Despite the fact that these floods were extremely disastrous, all experts agreed that none approached in intensity the one of 1865, and predicted that a flood of "major proportions" would cover most of the Valley, and completely destroy or cripple all the railroads and highways. They based this prediction upon the fact that the past six important floods occurred at fortunate times when the encircling high mountains were practically devoid of snow, and added that if "a long period of warm rainfall strikes the Valley at a time when the mountains are covered with deep snow, the floods would cover the entire Valley from mountain range to mountain range."

The United States Engineers' survey of 1943 disclosed that such a catastrophe occurring in the San Bernardino Valley during the war would seriously disrupt the war effort and prolong hostilities in the Pacific War Theatre. This survey, together with a more comprehensive one on the entire Santa Ana River Basin, was submitted to Washington. Based upon the joint reports, a project for the control of floods on Lytle Creek and Cajon Creek was adopted by Congress in the Flood Control Act and approved on December 22, 1944.

This Lytle Creek and Cajon Creek Flood Control project provides for a system of levees and groins, as well as a concrete channel, to divert the flood waters from the populated areas in the vicinity of the cities of Colton and San Bernardino, and to carry these waters to Warm Creek, just above its confluence with the Santa Ana River. The total overall cost of the project is $8,807,000.

As has been indicated, the main purpose of the project was to prevent floods in this highly strategic district to the end that traffic of war materiel might continue uninterruptedly for the duration of the Pacific war. Plans and specifications were made at top speed,



• Above: Initial excavation for intake structure above foothill in foreground and excavation for bypass levee cut-off trench in background. Below: Footing block and bearing wall forms of Colton Ave. Bridge. Fine grading and steel installation in channel floor in background.

• Looking downstream at base of lower Santa Fe covered section. Shoofly to accommodate main line traffic is just beyond.

as it was deemed imperative that the project be in working order by January-February (1946), the months of heaviest rainfall.

In May, 1945, plans were completed and bids invited for the construction of the upstream levees and groins. Construction began within three days after the letting of the contract to the Winston Brothers' Company of Minneapolis, Minn., The Utah Construction Company of San Francisco, Calif., and the A. S. Vinnell Company of Alhambra, Calif., working together as a unit on the project. This contract included construction of 15 levees and groins and bypass on Cajon and Lytle Creeks. The contract for the lower portion of the project, construction of the Lytle Creek concrete channel, intake, and outlet structures, was let to the Bressi-Bevanda-Macco Company.

The plans called for three separate phases of construction: (1) a combination of groins and levees to confine the flood waters to existing channels on the upper part of the alluvial cone above Foothill boulevard; (2) a concrete channel, with a capacity of 30,000 cu. ft. per second, to carry the collected waters into Warm Creek; and (3) a concrete weir to bypass excess flow into an existing channel and carry it through the lower part of the alluvial cone below Foothill Boulevard.

The levees and groins are composed chiefly of material excavated from the wash areas, and are faced with grouted stone on the channel side. They are from 10 to 20 feet high, have a crown width of 18 feet, and have side slopes of 1 to 2 on the land side, and 1 to 2.25 on the channel side. The quarrystone facing, which is 1.5 feet thick at the top of the slopes, increases in thickness to 2.0 feet at the toe of the slopes. The facing is completely grouted, and extends approximately ten feet below the elevation of the stream bed. Quarrystone is placed over the grouted stone facing at the toes—the voids being filled with stream bed material—so that the toes of the levees and groins are protected from scour.

The reinforced concrete channel below the intake structure is 40 ft. wide and has walls varying from 20 to 25 ft. in height. Each channel wall is an L-type retaining wall, with a toe slab that forms half of the channel. The walls have been built to withstand loading conditions resulting from an equivalent fluid pressure of 62.5 pounds per cu. ft. acting on the outside of the wall when the channel is empty, and 62.5 pounds per cu. ft. acting on the inside, against 41.7 pounds per cu. ft. on the outside, with the channel full.

The walls were designed to conserve critical materials, particularly steel. Even so, 11,340,000 pounds of steel were used in the lower portion of the project. In addition, 130,000 cu. yds. of concrete, 174,000 barrels of cement, 25,000 sq. ft. of piling from 20 to 60 ft. long were used in the construction. The ready-mixed concrete used on the lower project was furnished by Rock Products Company and Triangle Certified Concrete, Inc., joint venturers.

Working unit stresses for channel walls, inverts, and appurtenent structures, except bridges, are as follows:

a. f_{l_c} — 3,000 pounds per square inch at 28 days.
b. f_c — 900 lbs. per sq. in.
c. n — 10.
d. f_s — 24,000 lbs. per sq. in. (intermediate grade steel).

For highway and railroad structures, working unit stresses are as follows:

a. f_{l_c} — 3,000 pounds per sq. inch at 28 days.
b. f_c — 1,050 pounds per square inch.
c. n — 10.
d. f_s — 20,000 pounds per square inch (intermediate grade steel).

A four-inch wearing surface of concrete is used in addition to two inches of concrete provided to cover the steel reinforcing. This extra protection was deemed advisable since a large amount of sand and gravel may be carried over the concrete channel invert slab by flood flows. A special concrete mix was used in the top four to five inches of the invert slab so that dense concrete with a low water-cement ratio could be obtained.

Also included in the project were the reconstruction of one existing highway bridge and replacement of one railroad bridge with covered section of channel, as well as new construction of four highway bridges and three covered sections for railroads. The highway bridges, with the ex-

ception of the one at Colton Avenue, are designed as reinforced concrete simple beam structures of T-beam construction. The railroad covered sections and the highway bridges at Colton Avenue are designed as reinforced concrete box sections.

On the upper part of the project, there were three major items of construction. The first item consisted of building of levees and groins, the excavation for which included the following earthwork quantities: 53,000 cu. yds. of stripping; 504,000 cu. yds. of common excavation; 215,000 cu. yds. of compacted fill; 835,000 cu. yds. of levee fill; 17,500 cu. yds. of structure backfill; 252,800 cu. yds. of uncompacted fill and backfill.

The second major item was furnishing and placing of quarrystone: 236,710 tons of quarrystone apron, 253,300 tons of quarrystone blanket, and 12,320 tons of derrick stone were moved in all.

The third major item of the upper construction concerned the grouting, of which there are 71,560 cu. yds. used for quarrystone blanket. In all, there are 13,910 cu. yds. of concrete in the bypass structure and miscellaneous work.

The terrain presented no unusual problems as the ground was fairly level, and the soil is principally sand. First, the 210 acres of ground was cleared and grubbed. Bulldozers and scrapers were used on the job. The clearing of the site consisted of removal of brush and roots from areas to be used as borrow, and upon which fill was to be placed.

• Initial channel excavation near Cadena St. Bridge.

Stripping was required only in areas to receive compacted fill. The only drilling and blasting done was in quarrying of stone, which was brought from Lytle Creek Canyon, approximately seven miles distant. The rock was hauled over a road constructed especially for this purpose by the contractors.

The upper part of the project—including the excavation—is now about 40% completed. The work has been in progress for approximately five months. It is estimated that the entire project will be completed by June 30, 1946.

A great deal of excavating was necessary in the lower part of the project—consisting mainly of the construction of the concrete channel. In all, some 1,250,000 cu. yds. of excavation and 500,000 cu. yds. of backfill were required. The material was sand on top, with gravel deeper in the stream bed.

On the lower section of the project, 12 to 14 tractors and scrapers were used, one power shovel, and four trucks. Also, at one time a few scrapers were used. No stripping was necessary on this job, as all work was done in the stream bed. Also, no blasting or drilling was necessary because of the sandy quality of the soil.

The work on the lower part of the project was started on June 10, 1945, and was completed by November 15, to the extent that water was running in the channel.

The quarry rock used in construction of the channel was brought from Riverside, approximately eight miles away. In addi-

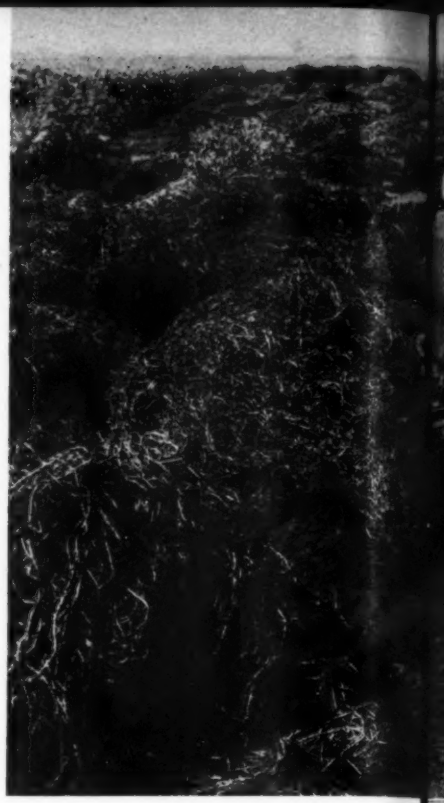
(Continued on page 163)

• The crane boom lying across channel in foreground carried all transcontinental telephone lines during the construction period. Arrow Route Bridge and detour are just beyond.

Peppermint Farming

William Gehring uses excavating equipment to advantage in drainage irrigation work of farming about 2,000 acres of mint on Indiana peat bog, one of America's most unique agricultural enterprises.

By W. H. KREICKER



• Above: Bucyrus-Erie bulldozer on International TD-9 tractor pushes out of the way refuse from which oil has been extracted. The refuse is mulched in huge piles for return to the soil. Right: Refuse pulled by chain from tractor-drawn trailer. Bulldozer also smooths out the ruts in the soft mucky soil.

THE NEXT TIME YOU eat chocolate - covered mints, chew peppermint-flavored gum, or clean your teeth with peppermint-flavored tooth paste, bear in mind that the oil of peppermint used to flavor them might have come from one of America's most unique agricultural enterprises, the farms of William Gehring in Indiana.

While headquarters for the enterprise is at Rensselaer, Indiana, the farms extend for miles across the county, enveloping many small communities. Over 3,400 acres are under cultivation, only 550 acres of which are leased from other owners. Mint, of the English variety, is grown on approximately 1,900 acres of the total acreage, and potatoes, onions, and sweet corn, for canning, are grown on the remainder.

• Cleaning outfall drainage ditch with Buckeye Clipper Model 70 clamshell.

The major portion of the acreage appears to have been a shallow inland sea in pre-historic times, later a vast marsh, and finally a far-flung peat bed, as decayed vegetation lifted the level of the soil above the water table. The peat extends down to more than 39 feet and is underlaid with marl or clay in places. Here, properly cultivated, is an ideal spot for the production of food for a hungry world, but many farmers had failed to eke out an existence on these peat lands which were considered sub - marginal. William Gehring, called "Bill" with genuine affection by his many employees and co-workers, made a study of this particular soil and the problems involved in its profitable cultivation. A farmer himself and from a farm family with a successful background, Bill Gehring has certainly found the answer, if the huge undertaking with its hundreds of employees and thousands of machines, tools and buildings is any criterion.

Construction Equipment

Farming 3,400 acres not only calls for farm implements by the hundreds, but requires a sizable amount of construction equipment. There are private roads and bridges to maintain, streams, channels and reservoirs, or ponds, to clean out, and sink holes to fill and level.

Because of the nature of the soil on Gehring's farms, a comprehensive drainage system is required. Installation and maintenance of such a system calls for more than the usual amount of construction equipment that would be required for a farming program of this magnitude.

Soon after the 1945 harvest, a

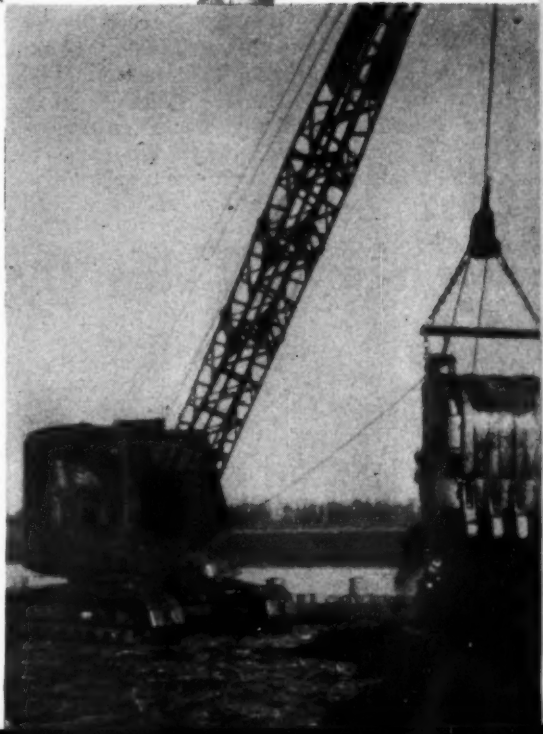
• Concrete weir, or spillway. Oak planks are slipped into steel channels to retain water level when it is desired to retain moisture in the tiles during a dry period.

• Above: View across 300 acres being drained. "Mexican Village" at far end of field is a complete community to house migratory workers in harvest seasons. Below: John Eckert & Sons' Bay City dragline digging trench for 24" drainage main.

drainage project was embarked upon; not on the "north forty" but on the "south 300." Over 600,000 feet of drain tile is involved. Some sections of the farms have already been tiled, some require initial tiling, and some lands require retiling.

On this particular 300 acre project, six inch clay tile is being used for laterals. These drain into mains consisting of 16-inch concrete tile which expand to 24-inch lines toward the discharge ends. The fall is 1¾ inches per 100 feet. Trench for laterals ranges from three to four and one-half feet deep. The mains empty into wells equipped with gate valves to control the rate of drainage. The wells discharge into open drainage ditches about 20 feet across and six to eight feet deep, and these in turn flow into a wide channel which empties into the Iroquois River, some miles away. This channel also receives drainage from other lands flanking it.

Trench for the tract being drained is being excavated by three Model 1 Buckeye trenchers owned by Gehring. Trench for the 16-inch and 24-inch tiles is being dug with two draglines, one a Model 70 Buckeye Clipper Crane equipped with Omaha ½ and ¾ cu. yd. dragline buckets owned by the Gehring farms, and the other a Bay City Model 45 owned by John Eckert & Sons, San Pierre, Ind. The crews operating the trenching machines report up to 5,380 feet of tile laid per machine per day. A Bucyrus-Erie hy-



draulic bulldozer on an International TD-9 TracTracTor does the backfilling, soil-packing and leveling, being kept busy by the three trenchers. A layer of straw several inches thick is placed over the tiles to form a mat that will minimize silting before backfilling.

Much Equipment Required

In addition to the draglines, trenchers, and bulldozer, Bill Gehring's "super - farm" uses many other pieces of construction equipment. A Jaeger classification 40-M portable pump is used to pump excess water from the excavations where concrete is to be poured for the wells at main terminals and for other construction work. A classification 7-S Jaeger concrete mixer is used to make concrete for wells, retaining walls, bridge abutments and overflow weirs. A LeTourneau Carryall is used to move spoil banks, and to build roads and levees. A special 12-ft. wide, 60-ft. long, rubber-tired, land-leveling fresno, custom-built by an Arvin, California firm, is also included in the equipment.

A Caterpillar D-7 tractor powers the Carryall. Other tractors used on the farm include one International, TD-14, six International TD-9s, two TD-6s, and four Cletracs. The smaller tractors are used mostly in such farming operations as planting, spraying and harvesting. The larger tractors are used to pull especially made hitches whereby three implements are pulled abreast, taking a swath through the field from 30 to 36 inches wide. Tandem discs, fertilizer drills, floats, cultipackers and spike-tooth harrows are also pulled in this manner.

Six International MDs equipped with dual rubber and eight International gas tractors are used for general farm work and in pulling the 33 International trailers used to haul produce and supplies from the warehouse to the fields, and from the fields to the packing buildings.

• One of three Buckeye Model 1 trenchers owned by William Gehring at work on mint farm.

When not working on trenching, mulching and other projects, Gehring's Buckeye dragline and Bucyrus-Erie bulldozers are kept busy, in all seasons, cleaning out the ditches and the drainage district channel, leveling land and cleaning up.

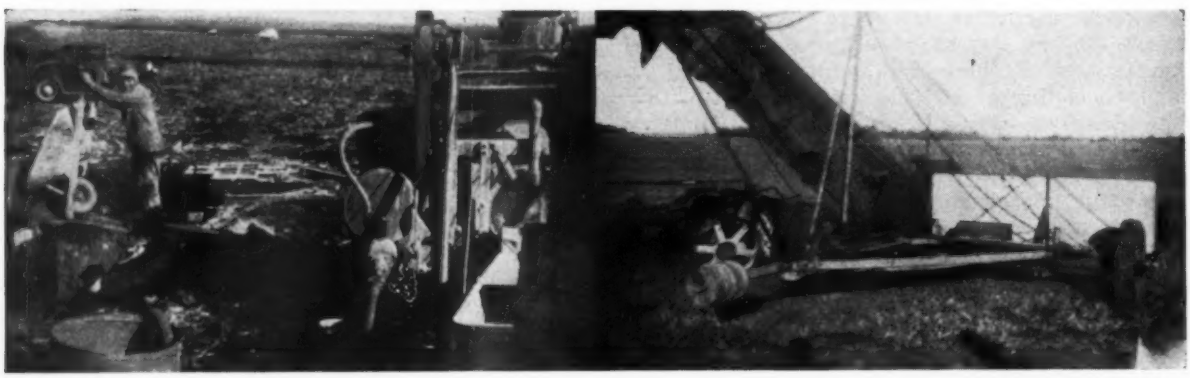
At the confluences of the ditches and the channel, concrete weirs or spillways have been built. They are equipped with heavy oak planks which can be removed, or added, to lower or raise the water level in the ditches. If the water level in the channel is so high that drainage from the ditches cannot be carried off, planks are fitted into grooves provided in the weirs and the water is pumped from the ditches over the weir into the channel. For this purpose, nine Fairbanks Morse 12-inch to 20-inch vertical shaft pumps located in nine separate pumping stations are used, some powered by Buda six-cylinder gasoline engines and some by International diesels.

Fields of mint stretch as far as the eye can see for miles along the back country roads that dissect these farms. Of the total 3,400 acres under cultivation, over 1,900 acres are planted with mint, which, while hardy, requires special cultivation and anti-freezing techniques.

Between 70,000 and 90,000 lbs. of oil of peppermint are produced annually. Three stills are operated at convenient locations on the farms. Each is equipped with dual high pressure boilers fed by Iron Fireman Stokers. The tall stacks on the stills can be seen from miles away. The harvested plants from which the oil is extracted, is mulched in huge piles for return to the soil, together with mixed fertilizer, principally phosphate and potash.

Onions and potatoes also grown on the farm carry the brand "Limberlost," taken from the name of the low, flat lake and marsh country of Northern Indiana immortalized by the author, Gene Stratton Porter, in her book "The Girl of the Limberlost."

• Below Left: Jaeger pump and Jaeger concrete mixer are used, respectively, to pump water from circular excavation which is being concreted for a terminal for mains. Below Right: Special mint harvesting machine that combines functions of mowing, gathering or raking, and elevating crop to trucks which run alongside of this harvesting machine.



• Bucyrus-Erie ¾-cu. yd. shovel loading old railroad embankment to trucks for fill.

Helping Nature Excavate New England

Arthur Whitcomb of Keene, N. H., largest earth-moving contractor in the state, uses modern excavating equipment to carry on, where nature temporarily stopped, in changing the topography of New England.

By HAYES BIGELOW

WHEN THE ICE AGE came, New England was a great high sheet of flat rock — not the hardest rock nor the oldest, but plenty old and plenty hard, and several thousand feet thick. Things being whatever way they were—and that's still a conundrum—ice formed on top of that rock a mile or two deep. Then it melted and formed again, and repeated the performance, perhaps four or five times. Whenever the ice was present it moved a little, scratching and gouging the rock, finding cracked and softer places to loosen great lumps, useful for further rock grinding operations. Earth-heat and friction melted ice next to the rock, forming streams that sought lower levels and rolled along rock fragments as big as a house and as small as a dime which helped the ice wear away the surface. During periods when the area was ice-free, there were extremes of climate; wet and hot, with palms looking down on lush green swamps and savannahs inhabited by enormous lizards, and dry and cold, with great winds depositing dust in windrows miles long and hundreds of feet high, leaving bare rock to weather and crack again.

For millions of years ice formed and melted, climates changed, life appeared and departed. But there was one thing present pretty much of the time—moving water full of boulders and silt. Endlessly it completed what ice began. The waterborne boulders and silt-carved valleys, created basins for lakes, made mud from rock and spread it around, and then

• End of old embankment to left of railroad track. Rest of embankment has been torn down and trucked off for local fills.

• Pittsburgh Plate Glass Co. brush handle plant grounds at Keene filled in with 10,500 cu. yds. of the embankment material excavated by Arthur Whitcomb.

grooved out of it the little stream and river beds we now have.

New England topography is a good example of the results of these developments. Just now it is free of ice, has been for quite a spell—say half a million years—and seems likely to be for a future as long. It is full of hills. and mountains not very regularly faced, with the main run of them from N. N. East to S. S. West, with scratches in the hard rock of the tops showing that at least the last ice to cover them moved in that direction. These heights have no great depth of soil, bed rock sticks out of many, and a 50-foot hole will find bedrock almost anywhere—though you can't be sure, because of those great winds that blew dust into windrows long ago. But in the valleys and lake basins the loose material laid down by the ancient streams is very deep, sometimes hundreds of feet of clay and pebbles and boulders. Sharp sand and gravel isn't plentiful, since practically all this material is waterworn.

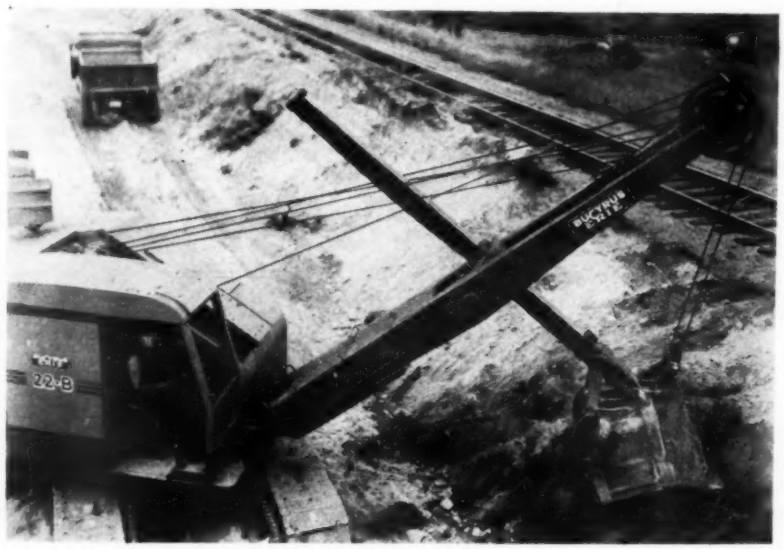
In the midst of this stupendous natural excavation that is New England, this gouging out of the hard rock sheet to depths of thousands of feet, stands Mount Monadnock. Solitary, it rises some three thousand feet of rock so hard that all the attacks of ice and water have not levelled it, though it has been much larger. In times of melting ice, glaciers moved down its furrowed surface on every side, and around it hollowed out numerous lake basins. Northwest of the mountain there was once a roundish lake covering at least 50 square miles. This lake has drained away and dried up, leaving nearly level bottomlands, surrounded by hills. In about 1750, white people settled in the northeast part of these bottomlands, and prospered as farmers and artisans. They made glass and wove wool. By 1835 there were 5,000 inhabitants in this place called Keene, New Hampshire. They craved a railroad. So did everybody. It was a fever. Along about 1845, after false starts, a railroad did get started from Fitchburg, Mass., headed for Keene and Bellows Falls, Vt. Wild Irishmen built it with shovels and horse scrapers and tipcarts, and by May, 1848, fought the grade and themselves into Keene, and so onward some 25 miles to Bellows Falls, which they reached on January 1, 1849.

Anyone who has had to struggle by hand with the frozen soil of a New England winter can understand that these pioneer railroad builders probably started fights to keep from freezing to death.

Sometime in the 1870s another railroad came into Keene, from Manchester, N. H. This, too, was mainly built by hand, Italians assisting the Irish in keeping warm. To get into Keene and out of the hills this line crossed over the tracks from Fitchburg on a high bridge and continued half a mile on an embankment before dropping to ground level and proceeding into Keene with the line from Fitchburg.

It is this railroad embankment of rock reduced to sand by ice and water through the grinding movements of millions of years, dug out by hand from cuts and pits and moved so laboriously to the environs of Keene, that may serve to connect the measureless past of nature's excavation with the earth handling of a mechanized present. Compared to the huge achievement of the ice ages, today's excavations are as nothing; but the power shovels, scrapers, bulldozers, trucks, etc., of the

(Continued on page 162)



• This abandoned Manchester-Keene railroad line was laid on a half-mile long embankment before dropping to ground level to enter Keene.

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STATE HIGHWAY MILEAGE - 1944

SUMMARY OF MILEAGE BUILT DURING YEAR BY STATE HIGHWAY DEPARTMENTS

P-3430

PUBLIC ROADS ADMINISTRATION FEDERAL WORKS AGENCY

COMPILED FOR CALENDAR YEAR FROM REPORTS OF STATE AUTHORITIES

TABLE SMB-1, 1944
ISSUED DECEMBER 1945

STATE	MILEAGE GRADED AND DRAINED								MILEAGE SURFACED										STATE
	ON RURAL ROADS UNDER STATE CONTROL				ON URBAN EXTENSIONS OF STATE HIGHWAY SYSTEM UNDER STATE CONTROL	TOTAL MILEAGE GRADED ON ROADS AND STREETS UNDER STATE CONTROL	OTHER MILEAGE GRADED BY STATE HIGHWAY DEPARTMENTS 1/	TOTAL MILEAGE GRADED AND DRAINED	ON RURAL ROADS UNDER STATE CONTROL				ON URBAN EXTENSIONS OF STATE HIGHWAY SYSTEM			TOTAL MILEAGE SURFACED ON ROADS AND STREETS UNDER STATE CONTROL	OTHER MILEAGE SURFACED BY STATE HIGHWAY DEPARTMENTS 1/	TOTAL MILEAGE SURFACED	
	PRIMARY STATE HIGHWAY SYSTEM	SECONDARY STATE HIGHWAY SYSTEM	COUNTY ROADS UNDER STATE CONTROL	TOTAL					PRIMARY STATE HIGHWAY SYSTEM	SECONDARY STATE HIGHWAY SYSTEM	COUNTY ROADS UNDER STATE CONTROL	TOTAL	UNDER STATE CONTROL	ON CONNECTING STREETS NOT UNDER STATE CONTROL	TOTAL				
ALABAMA	11	-	-	11	-	11	-	11	270	-	-	270	16	-	16	286	40	326	ALABAMA
ARIZONA	6	-	-	6	-	6	23	29	108	-	-	108	1	-	1	109	6	115	ARIZONA
ARKANSAS	-	-	-	-	-	-	-	-	84	-	-	84	8	-	8	92	40	132	ARKANSAS
CALIFORNIA	-	-	-	-	-	-	7	7	261	325	-	586	44	-	44	630	120	750	CALIFORNIA
COLORADO	-	-	-	-	-	-	-	-	5	51	-	56	2	-	2	58	-	58	COLORADO
CONNECTICUT	-	-	-	-	-	-	-	-	61	-	-	61	8	-	8	69	45	114	CONNECTICUT
DELAWARE	-	-	-	-	-	-	-	-	-	-	7	7	-	1	1	7	-	8	DELAWARE
FLORIDA	14	-	-	14	-	14	-	14	423	-	-	423	63	-	63	486	-	486	FLORIDA
GEORGIA	2	-	-	2	1	3	15	18	565	-	-	565	86	-	86	651	162	813	GEORGIA
IDAHO	29	-	-	29	-	29	-	29	98	-	-	98	1	-	1	99	25	124	IDAHO
ILLINOIS	3	-	-	3	-	3	-	3	391	-	-	391	23	-	23	414	158	572	ILLINOIS
INDIANA	-	-	-	-	-	-	1	1	1,160	-	-	1,160	51	-	51	1,211	6	1,217	INDIANA
IOWA	2	-	-	2	-	2	10	12	172	-	-	172	37	-	37	209	10	219	IOWA
KANSAS	-	-	-	-	-	-	-	-	267	-	-	267	4	-	4	271	70	341	KANSAS
KENTUCKY	2	-	-	2	-	2	-	2	576	-	-	576	50	-	50	626	-	626	KENTUCKY
LOUISIANA	-	-	-	-	-	-	-	-	23	2/ 25	-	48	3	-	3	51	-	51	LOUISIANA
MAINE	14	-	-	14	-	14	-	14	10	2/ 22	-	32	1	-	1	33	-	33	MAINE
MARYLAND	-	-	-	-	-	-	-	-	55	-	-	55	1	-	1	55	-	56	MARYLAND
MASSACHUSETTS	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	1	12	13	MASSACHUSETTS
MICHIGAN	9	-	-	9	-	9	-	9	435	-	-	435	25	-	25	460	11	471	MICHIGAN
MINNESOTA	5	-	-	5	-	5	-	5	278	-	-	278	24	-	24	302	-	302	MINNESOTA
MISSISSIPPI	-	-	-	-	-	-	-	-	13	10	-	23	4	-	4	27	39	66	MISSISSIPPI
MISSOURI	-	-	-	-	-	-	-	-	52	10	-	62	5	-	5	67	-	67	MISSOURI
MONTANA	4	2	-	6	-	6	-	6	37	41	-	78	1	-	1	79	-	79	MONTANA
NEBRASKA	-	-	-	-	-	-	-	-	120	-	-	120	3	-	3	123	-	123	NEBRASKA
NEVADA	-	-	-	-	-	-	-	-	23	-	-	23	2	-	2	25	-	25	NEVADA
NEW HAMPSHIRE	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	1	-	1	NEW HAMPSHIRE
NEW JERSEY	-	-	-	-	-	-	-	-	21	-	-	21	-	-	-	21	11	32	NEW JERSEY
NEW MEXICO	14	-	-	14	-	14	-	14	157	-	-	157	5	-	5	162	-	162	NEW MEXICO
NEW YORK	-	-	-	-	-	-	-	-	235	-	-	235	-	-	-	235	30	265	NEW YORK
NORTH CAROLINA	-	-	57	57	-	57	-	57	203	-	153	356	29	-	29	385	-	385	NORTH CAROLINA
NORTH DAKOTA	-	-	-	-	-	-	-	-	132	-	-	192	3	-	3	195	-	195	NORTH DAKOTA
OHIO	-	-	-	-	-	-	-	-	2,163	-	-	2,163	184	-	184	2,347	-	2,347	OHIO
OKLAHOMA	12	-	-	12	-	12	5	17	493	-	-	493	12	-	12	505	70	575	OKLAHOMA
OREGON	-	-	-	-	-	-	-	-	6	144	-	150	2	-	2	152	11	163	OREGON
PENNSYLVANIA	-	4	-	4	1	5	-	5	173	160	-	333	49	-	49	382	-	382	PENNSYLVANIA
RHODE ISLAND	-	-	-	-	-	-	-	-	3	-	-	3	-	-	-	3	-	3	RHODE ISLAND
SOUTH CAROLINA	2	-	-	2	-	2	-	2	64	-	-	64	4	-	4	68	2	70	SOUTH CAROLINA
SOUTH DAKOTA	17	-	-	17	-	17	-	17	67	-	-	67	1	-	1	68	-	68	SOUTH DAKOTA
TENNESSEE	-	-	-	-	-	-	-	-	193	-	-	193	3	-	3	196	43	239	TENNESSEE
TEXAS	65	-	-	65	2	67	-	67	376	-	-	376	2	-	2	378	39	417	TEXAS
UTAH	-	-	-	-	-	-	-	-	208	-	-	208	21	-	21	229	39	268	UTAH
VERMONT	-	-	-	-	-	-	-	-	4	-	-	4	-	-	-	4	-	4	VERMONT
VIRGINIA	-	-	9	9	-	9	-	9	10	-	265	275	-	-	-	275	-	275	VIRGINIA
WASHINGTON	-	-	-	-	-	-	-	-	58	104	-	162	1	2	3	163	62	227	WASHINGTON
WEST VIRGINIA	-	-	2	2	-	2	-	2	75	-	305	380	15	-	15	395	-	395	WEST VIRGINIA
WISCONSIN	-	-	-	-	-	-	-	-	871	-	-	971	57	2	59	928	10	940	WISCONSIN
WYOMING	-	-	-	-	-	-	-	-	93	-	-	93	2	1	3	35	34	130	WYOMING
DISTRICT OF COLUMBIA 4/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	DISTRICT OF COLUMBIA 4/
TOTAL	211	6	68	285	4	289	61	350	11,152	893	730	12,775	854	6	860	13,629	1,095	14,730	TOTAL

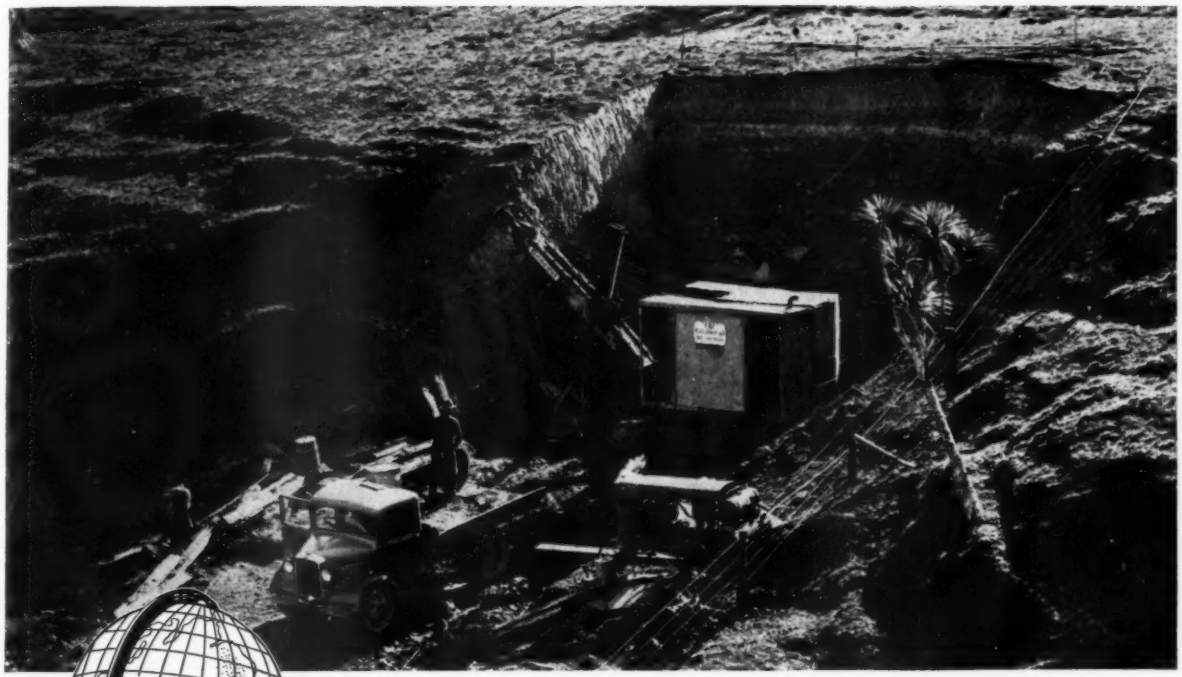
1/ INCLUDES MILEAGE BUILT BY STATE HIGHWAY DEPARTMENTS ON COUNTY OR LOCAL ROADS NOT UNDER STATE CONTROL, ON CITY STREETS OTHER THAN URBAN EXTENSIONS OF STATE HIGHWAY SYSTEM, AND ON FOREST, PARK AND INSTITUTIONAL ROADS, ETC.

2/ INCLUDES MILEAGE BUILT ON FARM-TO-MARKET SYSTEM.

3/ MILEAGE BUILT ON STATE-AID SYSTEM.

4/ NO CONSTRUCTION REPORTED.

DIGGING IN *"Down Under"* ...



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It's not surprising to find this veteran General shovel still turning in a full day's work every day, because 98% of all the Generals ever built are still in service. This particular General is shown at work on the Auckland-Warkworth Highway "down under" in New Zealand.

Such world-wide usage is evidence of the confidence construction and excavating engineers place in General-built equipment; confidence that is repaid by years of dependable, economical service. General's record of performance on the toughest construction jobs all over the world is a matter that deserves your serious consideration when planning to purchase new equipment.

Write today for complete information that points out how design, materials and precision construction are teamed up to provide General's built-in serviceability, its ability to do more work at less cost. And, if you'd like to know what's new in construction equipment, ask your nearest Distributor for details about the amazing new General Type 10—Model 105—the all-purpose rig, one-man operated, one-engine powered and mounted on pneumatic tires!

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CRANES, DRAGLINES
AND SHOVELS
DIESEL, GAS, ELECTRIC

Caution! Don't Base Bids Solely on Advertised Estimates

Courts have denied contractors, in the absence of exceptional circumstances, recovery of losses resulting from errors when they failed to verify approximate estimates before computing bids.

By LESLIE CHILDS

GENERALLY speaking, a highway, or other earth works contractor, should be cautious in relying solely upon the advertised approximate estimates as a basis for his bid. Especially so where, as is usual, the contract requires the contractor to certify to an examination and approval of the plans and specifications.

Here a contractor will usually be bound by his bid, and rarely have any recourse for loss resulting from mistakes of an engineering department in compiling the estimates. In other words, "approximate" estimates means what it says. A nice point for contractors to have in mind, and as examples of the possible cost of a slip-up here the following cases are in point.

Mistake Made in Estimates

In one case, a county advertised for bids on the construction of a highway, the work to be done in accordance with the attached plans and specifications. The county engineer's estimate of the gravel required was 3,050 cu. yds. The plaintiff, a contractor, without checking the correctness of the estimates, submitted a bid of $9,150.

The bid was accepted and it developed that the job required 1,820 cubic yards of gravel more than the advertised approximate estimate. This resulted from a mistake of the county engineer in making up the estimate. In due time the plaintiff sued for additional payment, at the rate of $3 per cu. yd. for the excess gravel supplied in completing the contract. The lower court denied any recovery. On appeal the higher court in reviewing the record, and in affirming the judgment, had this to say:

Reasoning of the Court

"The whole case * * * becomes an action * * * for the value of work alleged to have been performed in excess of the amount covered by the written contract upon the theory that in the execution of the contract the plaintiff mistook the amount included because of the error of the county engineer in the estimate placed in his notice to bidders. * * *

"It is pointed out by the (county) that in this notice the county particularly stipulated that the estimates of quantity were merely approximate and the prospective bidders not only directed to refer to the plans and specifications * * *, but was required to certify that he had carefully examined the plans and read the specifications. * * *

"The (county) points out that reference to the plans and specifications would have readily disclosed the discrepancy in the original estimate of the county engineer. * * * At most the complaint demonstrates that the (contractor) failed to investigate where an investigation would have disclosed the mistake upon which it now relies. * * * Judgment affirmed."

So much for that case. Let's take another. A city advertised for bids for the construction of a street improvement embankment. The approximate yardage to be handled was given as 17,087 cu. yds., but the work in fact entailed the removal of 28,000 cu. yds. The mistake resulted from an error by the city in totalling the tabulations.

Without examination, as he certified he had done, the plaintiff bid $19,849 on the job, relying, as he thereafter claimed, on the correctness of the engineer's figures. Plaintiff was awarded the contract, and after completion sought additional payment for the yardage handled in excess of the 17,087 cu. yds. given as the approximate estimate. In denying plaintiff a recovery, the court reasoned as follows:

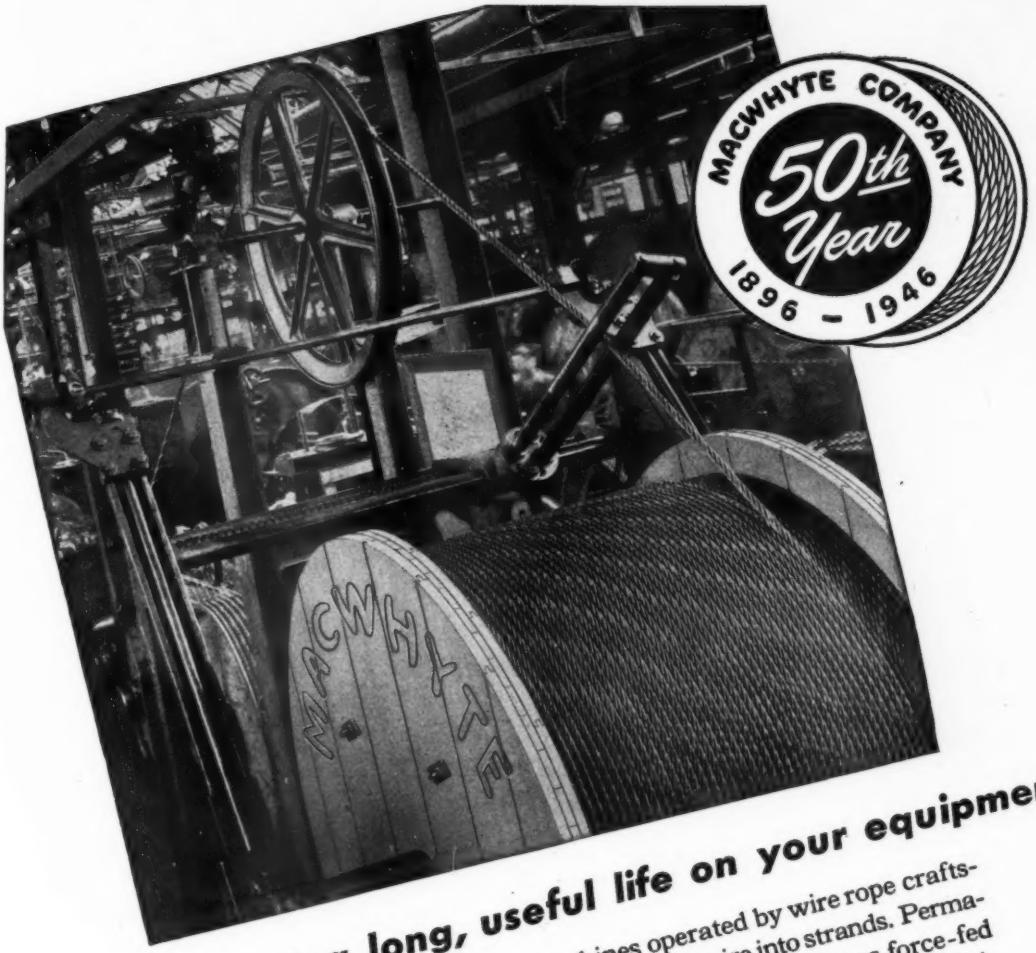
Court Decision

"All the data upon which the improvement was projected were on file and referred to in the advertisement for bids. The specifications likewise were on file and so mentioned. * * * With all the data before him that the city employed, * * * he cannot complain if his contract proves to be unprofitable. * * * The testimony shows clearly that the approximate figure of 17,000 cu. yds. was the result of merely a mistake in addition. * * *

"The essence of the case is that, having made an independent investigation of the plans, specifications, and work to be done, or at least having reported that condition to the city in writing, and having ample opportunity to inform himself of the true amount of embankment, the plaintiff has failed to prove the indispensable essential that he relied on the representations of the city. * * * This is fatal to plaintiff's recovery."

The foregoing was selected from a long line of cases of this character; cases in which con-

(Continued on page 163)



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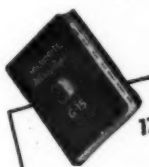
Here you see Macwhyte Wire Rope as it comes from the closing machine. It is now ready to start giving the long service that has been so carefully built into it.

Select quality steel rods were its beginning. They were scientifically heat-treated and cold-drawn, into tough, metallurgically uniform wire. Precision machines operated by wire rope craftsmen layed the wire into strands. Permanent internal lubrication was force-fed around each wire. Closing the lubricated strands completed the wire rope that will give longer, more economical performance on your equipment.

Macwhyte distributors and factory representatives are at your service.

Make MACWHYTE your headquarters for WIRE ROPE AND SLINGS



170-page Wire Rope Catalog G-15, yours for the asking

Lists Macwhyte's complete line. Gives other valuable information. Ask any Macwhyte representative or write Macwhyte Company.

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NO. 860-9

Field NOTES

Cold Weather Operating Hints

When operating under extremely low temperature conditions and heated storage space is not available, lubricating oil should be drained from the crankcase while the engine is warm and stored in a heated place. Lubricating oil should be heated to from 180° F to 200° F before being replaced in the engine crankcase.

When crankcase oil is not drained in cold weather, the oil drain plug in the bottom of the oil pan should be momentarily loosened to allow water accumulation and sludge to drain off before starting the engine.

There is a greater tendency for moisture to condense in the crankcase lubricating oil under low temperature operating conditions. Therefore, lubricating oil should be changed at more frequent intervals.

Preventing a Bolt from Turning

When wood is new and the fit is tight, squared heads of wood bolts will hold, but as time passes the hole frequently enlarges and the entire bolt turns. It is difficult to tighten or remove such a bolt because of the rounded head.

A simple method to solve this problem of turning bolts is to heat the head end of the bolt and flatten the squared portion, as indicated on the drawing. The section will spread out, as shown in lower sketch and the section to the right. The bolt won't turn then, and if you want a longer lasting job, fill the gaps with plastic wood.

This treatment will not weaken the bolt as a tension member to any appreciable extent. Torsionally, the bolt will be stronger in the flattened section than it was before flattening.

W. F. SCHAPHORST.

Maintenance Card File

Few are the contractors who do not keep adequate filing and record systems on sales, costs of doing business, salaries and wages, etc., but on the other hand not too many follow the lead of a number of contractors who have found it profitable to keep a maintenance card file as well.

Such a system will serve as an ever-vigilant guard over every unit of on-the-job equipment; will make certain that whenever maintenance is needed it will be promptly cared for; will insure that no maintenance chore has ever been overlooked, and will insure that in the contractor's regular maintenance check-ups not a single small piece of equipment has been overlooked.

The best system is to place the file in the hands of the equipment manager or the contractor himself. He then marks a definite date of the month when this file is to be used and puts it into action on that date each and every month. This may take the form of turning cards over to an employe for checking or making certain in some way that the check-up is done.

Thus if the card file is taken each month and used in an actual thorough check-up it can be made certain that nothing has been overlooked.

It is advisable that one card be made for every unit of equipment used on the job and if that unit can be profitably checked once each month that data should be on the card with a place to note the date of each check-up and the initial of the man who has made the check.

Other information which should be on such a card file (this being a compiled list from several such cards we have checked):

1) Name and location of unit.

2) How often a periodic inspection should be made with space for initialing each such inspection.

3) How often an over-all machine breakdown inspection should be made with space for initialing each such inspection.

4) Recommended grade and type of lubricant to be used and make notation as to how often a lubrication check should be made.

5) Ample space should be provided for "remarks and suggestions" for each of the above inspections with the warning that responsibility for failing to note any needed maintenance will rest with the checker if such notation is not made.

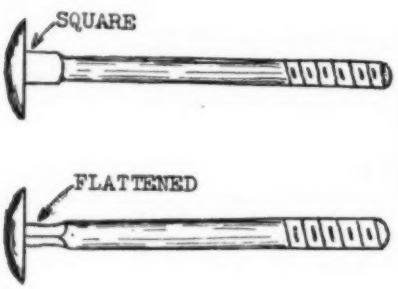
When these cards are filled out each month and returned to the proper official he then can:

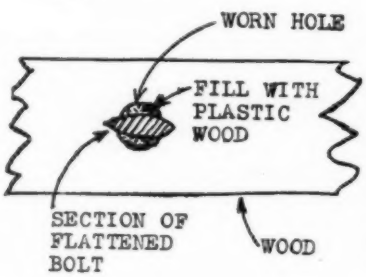
a) Make certain that each and every piece of equipment has been checked thoroughly or know the reason why.

b) Summarize the notations of the person inspecting and order any maintenance or repair work which may seem advisable.

These cards can also serve as a month-to-month record of the performance of each piece of equipment and the contractor can thus readily see his "trouble makers" which need replacement first. They also serve as a valuable record of maintenance costs to be considered on that particular unit when replacement time comes around.

ERNEST W. FAIR.





• Heating the head end of a wood bolt and flattening it, as indicated lower left, will prevent turning. Filling in gaps with plastic wood will give a longer lasting job.

An Improved Clay Sampler

By A. E. C. LONGSDON, B.A.

The need for carefully taken undisturbed samples from trial pits and bore-holes increases with the expansion in application of soil mechanics to the solution of engineering problems. The usual type of clay sampler consists of a steel tube with detachable driving head and cutting shoe. The assembled sampler is attached to the

HIGHBALL
California Channel Change
with 6 TOURNAPULLS

Lytle Creek Channel change between San Bernardino and Colton, California, must be completed before next spring's floods. The channel is being dug 27′ deep, 40′ wide at bottom and will be concrete lined. All available equipment is being used.

To contractor Clyde Wood, quick completion on his section meant Tournapulls, so he moved in a fleet of 6.

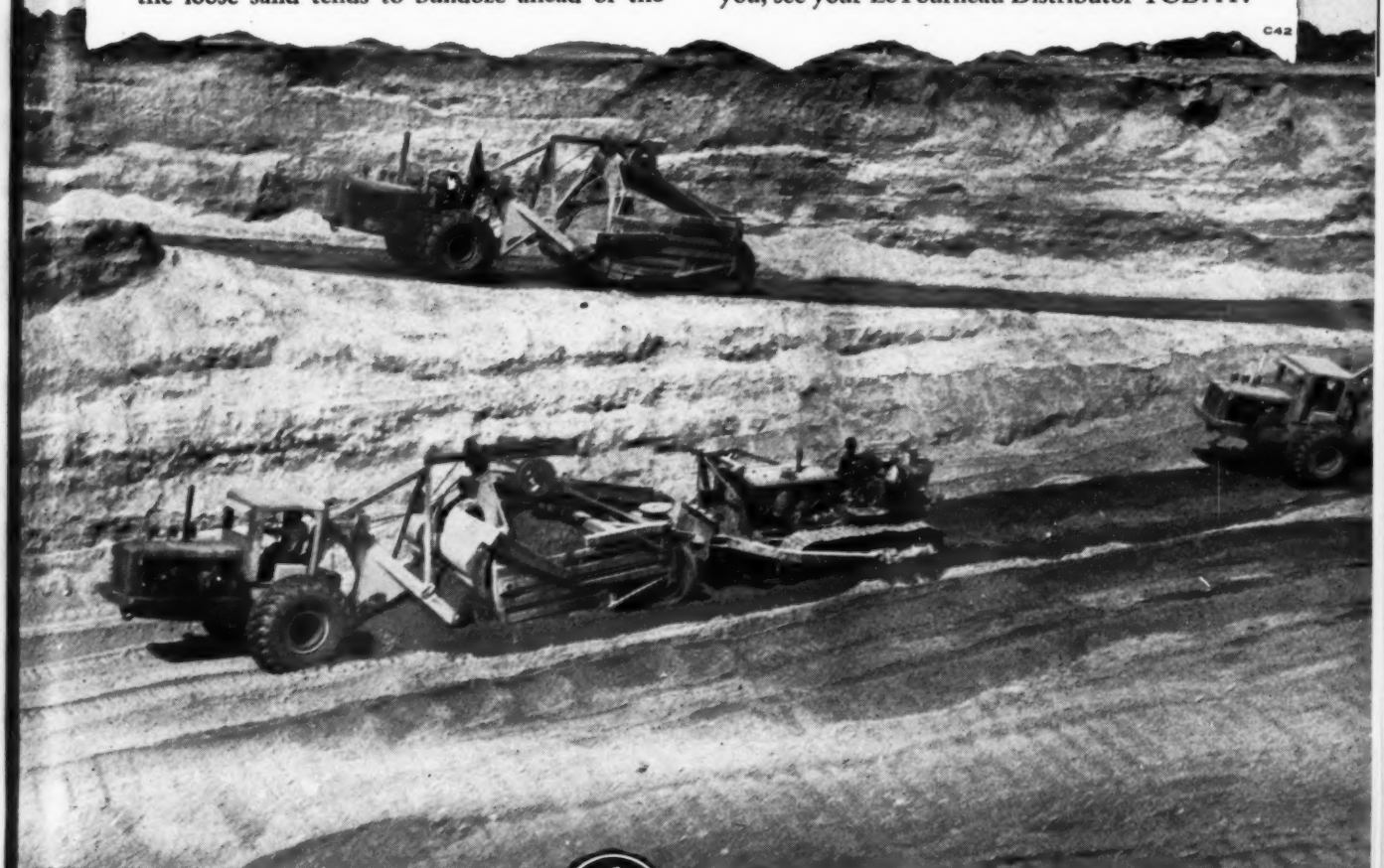
Heap full loads in dead sand

Working in loose sand the pusher-loaded Tournapulls get heaped 12-yard pay loads in 150′. Loading takes 1½ to 2 minutes because the loose sand tends to bulldoze ahead of the blade. To minimize this condition, water wagons wet down the cut and hauling ramps to help pack the sand . . . enable the Tournapulls to load faster and climb the steep grades without slippage.

Average 8000′ cycle every 11 minutes

Each Tournapull completes the 8000′ round trip in 10½ to 11 minutes in spite of tough loading and stiff grades! That figures around 56 pay yards per Tournapull per 50-minute hour. When your jobs are tough and rush . . . pick Tournapulls to pull you through at a profit . . . they are job-proved for lowest net cost per yard. To find out what Tournapulls can do for you, see your LeTourneau Distributor TODAY.

C42



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TOURNAPULLS*

* Trade Mark Reg. U. S. Pat. Off.

• Sampler with Head, Shoe, and Caps.

boring rods, lowered down the hole and driven into the clay with a monkey. The clay at the leading edge of the cutting shoe is sheared off by rotating the whole sampler, which is then withdrawn. Such a procedure may be considered satisfactory, and the samples considered to be relatively undisturbed provided that the area ratio of the sampler is small. The area ratio is the relation of the area of the steel to the area of the sample expressed as a percentage.

When the sampler has been brought to the surface and the driving head and cutting shoe removed, the sample is obtained from the tube with a lever or screw type extruder, waxed, and packed in a tin container with damp sand. This extruding and packing of the sample is generally carried out by the foreman without supervision, and may easily degenerate into an operation in which the sample is subjected to undue stresses and deformation. This is especially true of soft clays and silts, which require great care in handling. To overcome this the use of a sheet metal tube as a sample container has been tried. In this sampler the outer tube contains a split shell, which, in turn, surrounds the sample container, the split shell being essential to permit the withdrawal of the container from the outer tube. When the sample has been taken and brought to the surface, the ends are waxed in the container in which the sample remains till used for tests in the laboratory. Thus damage from unskilled handling is avoided, but this advantage is only gained at the expense of other disadvantages, for (1) the area ratio of this type of sampler is higher than that of the simpler type and cannot be considered satisfactory; (2) the containers are not usually machined nor truly circular, and so are apt to cause distortion; (3) the container must be cut up to obtain the sample, resulting in a waste of material and no small amount of labor.

Advantages of Sampler

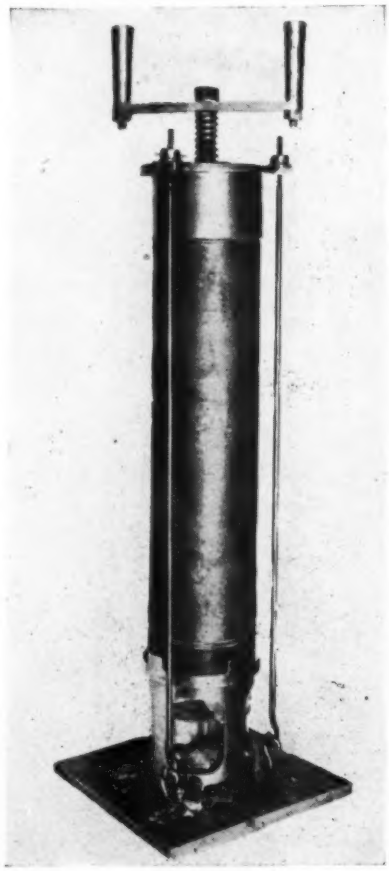
It is thought that the type of sampler illustrated incorporates the advantages of both the forementioned forms without the disadvantages of either, and this has been born out by experience in its use over the last two years. The samples are taken in the usual manner by the boring foreman, who on recovery of the sampler removes the driving head and cutting shoe, waxes the ends of the sample, leaving it in the tube, and screws on two caps to protect both the ends of the sample and the threads of the tube. A tube is required for each sample taken, as the sample still in the original tube in which it was taken is conveyed to the laboratory for tests. In the laboratory the sample can be extruded either as a four-inch diameter sample or as a number of one and one-half-inch diameter samples by the use of a special multiple device described later.

The sampler consists of an 18-inch length of B.S. four-inch diameter water barrel, fitted with a detachable cutting shoe and driving head. The use of B.S. four-inch bore water barrel has the following advantages: (1) Ease of supply of material; (2) standard pipe threads may be used; (3) standard four-inch caps may be used for closing the ends; (4) ease with which reproduction or expansion can be carried out; (5) cheapness. For field use at each boring rig there are required a number of sample tubes, each with two caps, a driving head, a cutting shoe—two of different internal diameter are in advantage in certain clays—and a set of "C" spanners. For laboratory use the requirements are an extruder, a special multiple sampler for taking one and one-half-inch samples from the four-inch sample, and a set of "C" spanners.

The driving head is threaded internally for one-inch length with a standard four-inch diameter pipe thread and carries a non-return valve to permit the escape of air and water when the sampler is driven, and also to assist in retaining the sample in the tube during withdrawal by the formation of a partial vacuum. Provision is made for attachment to the boring rods. The cutting shoe cannot be made satisfactorily from water barrel, but must be made either from solid-drawn pipe, if available, or else be machined from the solid. The cutting edge requires to be hardened, and care must be taken to avoid any distortion, for it is important that the bore 4.150-inches, or in some cases 4.100-inches, should remain concentric with the thread, which is an internal four-inch diameter pipe thread for a length of one inch.

Description of Tubes

The sample tubes consist of 18-inch lengths of four-inch diameter water barrel, threaded at each end for one and one-fourth-inch externally with four-inch standard pipe thread, and bored to a diameter of 4.200-inches, care being taken that the threads and inter-



• Extruder.

nal bore are concentric. Slots are provided on each tube and cap—as also on the driving head and cutting shoe—for the "C" spanners. The thickness of the tubes depends on the fluctuation of the water barrel, but it will be found in general that the walls are a full one-eighth-inch and that there is a full one-sixteenth-inch of metal at the base of the threads. The sample extruder consists of a head similar to the driving head which screws on to the sample tube in place of the caps. It carries a boss through which a one-inch diameter screw, with Acme thread, operates to extrude the sample. When a sufficient length of sample has been extruded for test, the rest can again be waxed and stored conveniently till further tests are required.

The multiple sampler consists of a frame with cut-away sides and four interchangeable bases designed to hold in a vertical position either one, two, three, or four sample tubes, which are of brass one-sixteenth-inch thick and of one and one-half-inch internal diameter, thus providing samples suitable for the triaxial compression and other tests. It will be noted that several samples can be taken side by side at the same horizontal for comparative tests under different conditions. Four samples may in some cases prove unsatisfactory, due to their proximity to the disturbed edge of the original four-inch diameter sample.

Operation of Sampler

The operation of this multiple sampler is carried out by setting up the required number of tubes on the appropriate base within the frame. The extruder for the four-inch diameter sample is fitted to the sample tube and both tube and extruder placed above the frame to which it is anchored by three rods. As the sample is extruded from the four-inch diameter tube, the one and one-half-inch tubes are filled and the waste portion is free to peel away through the ports cut in the side of the frame. Without some such apparatus, an unknown error may be introduced. If a one and one-half-inch diameter sampler is pressed into the clay, either in or out of the four-inch diameter sampler, it is hard to ensure that the one and one-half-inch diameter sampler penetrates the clay without wobble, causing deforma-

(Continued on page 162)

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***(uses rugged dependable* WICO)**

The volume of concrete to be poured in the next five years is anyone's guess . . . and chances are most guesses will be too low. From the profit standpoint, speed and continuous trouble-free service will count . . . that's why a WICO magneto is used on these Jaeger 4 yard High Dump Truck Mixers just as they are on other contractors' equipment where rugged built-in stamina counts.

For medium and small sized engines operating at speeds up to 2800 RPM, WICO Model C shown above produces a powerful spark through all speed ranges . . . out of all proportion to its small size and light weight.

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THE HEART OF YOUR ENGINE

Shots from the FIRING LINE

American Road Builders Hold 43rd Convention

More than 2,000 delegates heard leading authorities on a wide range of subjects dealing with road building during the four-day program of the 43rd Annual American Road Builders Association Convention in Chicago, Jan. 14-17.

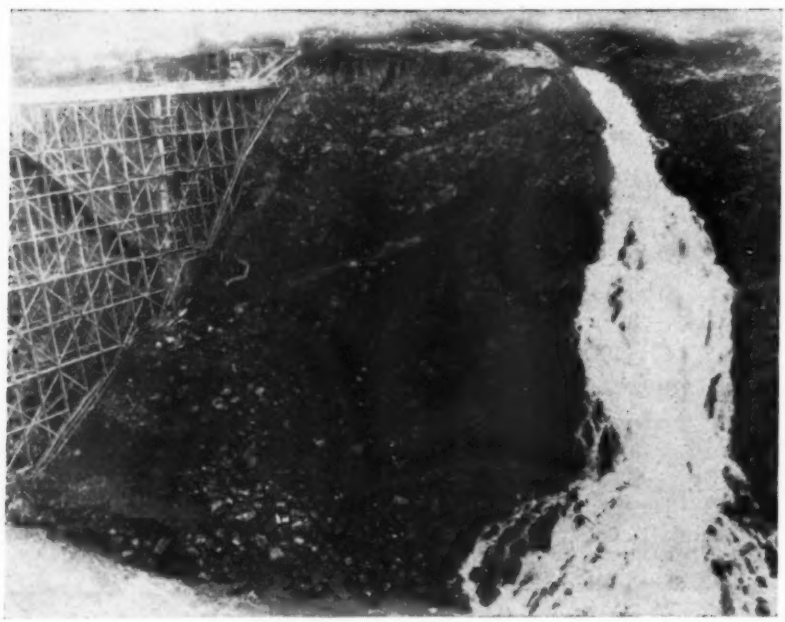
James J. Skelly, Media, Pa., was reelected president of ARBA. Paul B. Reinhold, Pittsburgh, Pa., succeds himself as vice president of the Northeastern District. Alex F. Hancock, Mobile, Alabama, became vice president of the Southern District, succeeding W. A. Young, Macon, Georgia. E. R. Galvin, Massillon, Ohio, was reelected vice president of the Central District. Robert A. Allen, Carson City, Nevada, became vice president of the Western District, replacing C. H. Purcell, Sacramento, California. H. C. Whitehurst, Washington, D. C., was elected treasurer.

Directors for a three-year term terminating in 1949 are R. H. Baldock, Salem, Oregon; Robert B. Brooks, St. Louis; J. F. Cast, Cleveland, Ohio; Bernard Gray, New York, N. Y.; W. W. Polk, Springfield, Illinois; A. R. Taylor, Pittsburgh, Pa.; and Nello Teer, Jr., Durham, North Carolina. Bernard Gray, general manager, Asphalt Institute, succeeds Walter R. Macatee who is now manager, airport division of the American Road Builders' Association. W. W. Polk, chief highway engineer for the state of Illinois, succeeds E. A. O'Brein of Harrisburg, Pa. The others were reelected.

Charles W. Smith, president, Smith Engineering & Construction Co., Pensacola, Florida, was again elected president of the Contractors' Division. L. W. Edison, Grand Rapids, Michigan, was elected vice president. Divisional directors, whose terms expire in 1949 include Robert P. Bayard, New York City; A. E. Finley, Raleigh, North Carolina; E. E. Hoebel, Madison, Wisconsin; Paul F. Hollinger, Akron, Ohio; J. D. Manly, Leesburg, Florida; Edward W. Forath, Detroit, Michigan; Joseph M. Spears, Washington, D. C., and W. A. Young, Macon, Georgia.

Contractors' Division also named the following as directors-at-large for one year; W. C. Butler, Hazleton, Pa.; Archie Campbell, Warwick, N. Dakota; Alex Hancock, Mobile, Alabama; W. A. Penick, Richmond, Va.; Carl G. Rose, Ocala, Florida; Nello L. Teer, Jr., Durham, N. Carolina, and Donald G. White, Chicago, Illinois.

• **AED officers for 1946 (left to right): C. F. Halladay, vice president, Western Material Co., Sioux Falls, S. D.; C. F. Winchester, executive secretary, Washington, D. C.; W. W. Bucher, treasurer, R. E. Brooks Co., New York City; W. J. Kane, vice-president, Kane-Gibb-Marr Co., Winnipeg, Manitoba, Canada. F. B. McBath, president, Columbia Equipment Co., Portland, Oregon; W. A. Danner, executive vice-president, Parker-Danner Co., Hyde Park, Mass., and H. O. Penn, retiring president, H. O. Penn Machinery Co., New York, N. Y. (Mr. Penn died the closing day of the convention.)**



• **WHERE RIVERS MEET — Waters from the Deschutes River in central Oregon recently tumbled in a spectacular cataract into the deep Crooked River canyon in the first man-made juncture of the two streams. Bureau of Reclamation engineers sent the Deschutes flow cascading into the deep chasm in testing a new irrigation canal which will eventually carry 1000 second-feet of water to farms on the 50,000-acre North Unit of the Deschutes irrigation project. Eventually, the water will be carried across the gorge by a massive concrete flume. This unusual structure, falsework for which is shown to the left of the waterfall, will also serve as a highway bridge. It will support a 30-ton crane to be used in operation and maintenance work on the project. A contract for completing the crossing was recently awarded to the McLaughlin Construction Company, Livingston, Montana. Initial irrigation service for the North Unit is scheduled for this spring.** ***Bureau of Reclamation Photo***

New County President

The new president of the County Highway Officials Division is Paul B. Rynning, county engineer of Jackson County, Medford, Oregon. He succeeds Arthur F. Ranney, of Akron, Ohio. As vice president of the Northeastern district, C. L. Kinnier, Arlington, Virginia, succeds himself as does Major Edmund Friedman, Corps of Engineers, USA, for vice president Southern District. A. W. Hinderson, Wapello, Iowa, is vice president for the Central District, following Duncan M. Campbell of Chicago. Chris P. Fauerso, The Dalles, Oregon is vice president of the Western District.

"CATERPILLAR" DIESELS

Stand out because they Stand up

WHEN a competitor says "Those 'Caterpillar' folks are quality-crazy," it's taken as a real compliment. For quality in all products is the first thing "Caterpillar" research engineers, designers, metallurgists and manufacturing heads think about. . . .

Quality that means dependable performance—no costly interruptions, no long or frequent down time. Quality that gives owners low fuel and other operating costs. Quality that assures low maintenance. Quality that reduces repair expense and parts replacements to the minimum. Quality that enables "Caterpillar" equipment to *stand up* —to lick the tough jobs, run many thousands of hours, assist the contractor to do good work at a substantial saving to his customers and at an attractive profit to himself.

What is a typical tough job? Levee building, for one. Working in heavy, sticky Mississippi River gumbo in particular. On the project spot-illustrated here, Luhr Bros. Construction used a fleet of scraper-operating "Caterpillar" Diesel Tractors of both track and wheel types. "Zoning" the equipment to fit the hauls and other needs speeded the work, cut cost, made more money.

Floodlighting, for double-shift operation, with a portable "Caterpillar" Diesel Electric Set helped further to shorten the completion time, reduced overhead and enabled earlier release of equipment for the next job.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

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ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT

THE DISCHARGED VETERAN WEARS THIS EMBLEM. REMEMBER HIS SERVICE AND HONOR HIM.

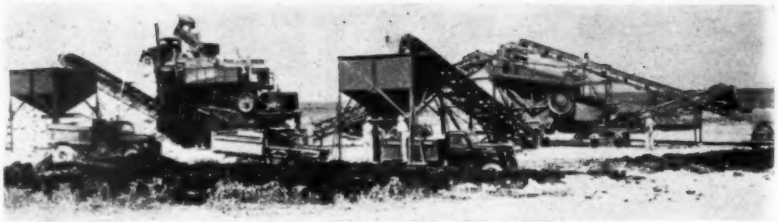
The former vice president of the district is the new president, Paul B. Rynning.

For directors whose terms expire in 1949, the following were elected: R. B. Bieri, Sturgeon Bay, Wisconsin; Alan N. Buck, Decatur, Illinois; W. B. Chilson, Falconer, New York; Ben T. Collier, Clarksdale, Mississippi; Otto S. Hess, Grand Rapids, Michigan; F. L. Phipps, The Dalles, Oregon; and Lew Selvidge, Olympia, Washington. Ben T. Collier succeeds himself. The others are newcomers to the board.

Nathan Smith Reelected

In the Municipal Division, Nathan L. Smith, Chief Engineer, Department of Public Works, Baltimore, Md., succeeds himself. Dudley T. Corning, vice president for the Northeastern District, and N. L. Marks, Jr., New Orleans, La., vice president, Southern District, were also reelected. George M. Shepard, St. Paul, Minnesota, succeeds Henry B. Steeg, Indianapolis, Indiana, as vice president of the Central District; and Walter M. Frickstad, Oakland, California, was reelected vice president of the Western District.

In the directorate, term to end in 1949, Harold D. Bradley, Toronto, Canada, succeeds R. C. Harris also of Toronto; DeWitt M. Coburn, Dearborn, Michigan; Paul J. Essick, Jr., Philadelphia, Pa.; John P. Hanoven, Rochester, N. Y.; Robert P. Mitchell, Philadelphia, Pa.; and H. G. Whitehurst, District of Columbia, and also treasurer of the American Road Builders' Association, were returned to office. George C. Stanley, Burlington, Vt., a former president of the division, was elected to succeed G. M. Shepherd of St. Paul, Minnesota.



• Houston Clinton Company of Hillsboro, Texas, averages 1589-cu. yds. of limestone per 10 hr. day with a Pioneer crushing and screening plant. The primary unit includes a traveling grizzly feeder with jaw crusher. The secondary unit is a 42-V plant with a 4'x12' vibrating screen and a 40"x22" roll crusher.

Manufacturers Elect

J. T. Callaway, assistant to the vice president, Goodyear Tire and Rubber Company, Chicago, was reelected president of the Manufacturers' Division. W. B. Greene, president of the Barber-Greene Company, Aurora, Illinois, was elected vice president and H. N. Schramm, President, Schramm, Inc., West Chester, Pa., was returned as secretary-treasurer.

Directors for the year are J. R. Steilman, vice-president, Koehring Company, Milwaukee, Wis.; L. W. Glaser, Sales Manager, Littleford Brothers, Cincinnati, Ohio; G. E. Spain, vice president, Caterpillar Company; E. M. Burgess, vice-president, R. G. LeTourneau, Inc., Peoria, Illinois; Kenneth Lindsay, vice president, Iowa Manufacturing Co., Cedar Rapids, Iowa; F. Salditt, vice president, Harnischfeger Corp., Milwaukee, Wisc.; W. B. Greene, president, Barber-Greene Company, Aurora, Illinois; John Keplinger, vice president, Hercules Motors Corp., Canton, O.; and Charles M. Upham, engineer-director, American Road Builders' Association, Washington, D. C.

Record Attendance at A.E.D. Convention

With a registration of close to 1500 distributors and manufacturers turning out for the 27th Annual Convention of Associated Equipment Distributors, A.E.D., at the Edgewater Beach Hotel, Chicago, January 28-31, C. F. Winchester, Executive Secretary of A.E.D., reports that although the organization's 1946 Convention attendance was limited

The Quality Line!

WELLMAN

Williams Type **BUCKETS**

• You get longer service with less maintenance when you use Wellman Williams buckets because this quality line pioneered the field in welded construction of high-grade rolled steel. *Wellman-built means better-built!*

SEND FOR BULLETIN

THE WELLMAN ENGINEERING CO.

7002 Central Avenue • Cleveland 4, Ohio

Sales and Service Agencies in Principal Cities

Built like a Shock Absorber

TO STOP TIRE DAMAGE FROM TOUGH SERVICE!

● General Off-the-Road Tires are built to *absorb* the heavy shocks and impacts of punishing service . . . built specifically to eliminate tire failure from service damage.

General calls it "shock-absorber" construction—a method of placing a thick, resilient layer of rubber directly under the tread and shoulders to absorb and distribute shock where greatest concentrations occur. Diminishing thicknesses are "sandwiched" between plies . . . bonding the whole into a flexible, shock-absorbing carcass that drastically reduces damage-failures . . . delivers more *original* service . . . more *recap* service.

Exclusive shock-absorber construction and unchallenged Top-Quality makes General Off-the-Road Tires your *one best* choice to get tire performance that pays dividends in savings.

THE GENERAL TIRE & RUBBER COMPANY • AKRON, OHIO

GENERAL OFF-THE-ROAD TIRES

to members only, this year's annual gathering exceeded by close to 500 the attendance during years when all members of the industry were invited to attend.

F. B. McBath, of the Columbia Equipment Company, Portland, Oregon, elected A.E.D. President for 1946, hails this unprecedented convention attendance as "proof that the industry is ready to undertake the greatest heavy construction program in history if we can get the materials and the labor."

Hamilton O. Penn, retiring President of A.E.D., was fatally stricken with coronary thrombosis on the closing day of the convention.

The Convention heard addresses by P. B. Reinhold, of the Atlas Equipment Corp., Pittsburgh, Pa., and G. R. Magney, architect, of Magney, Tussler & Setter, Minneapolis, Minn., on the subject, "Plans and Suggestions for Your New Plant," by A. F. Garlinghouse, of Garlinghouse Brothers, Inc., Los Angeles, on "A.E.D. and the Veteran"; by U. S. Senator and former member of the War Labor Board Wayne L. Morse, on "The Responsibilities and Rights of Employers in Labor Controversies"; A. E. Paxton, Publisher of Engineering News-Record and Construction Methods, of New York, N. Y., on "The Construction Outlook," by Henry Hale, Milton-Hale Machinery Co., Albany, N. Y. on "The Distributor Outlook"; Harry A. Dick, President of the Gilpin Construction Company, of Portland, Ore., and President of Associated General Contractors of America, Inc., on "What Do Contractors Think of the Future"; J. T. Calloway, of the Goodyear Tire & Rubber Company, and President of the Manufacturers' Division of American Road Builders' Association, on "The Common Goal"; G. M. Just, Credit Manager of the International Harvester Company, Chicago, on "Manufacturers' and Distributors' Credits."

Also, Carol F. Winchester, Executive Secretary of Associated Equipment Distributors, on "A.E.D. and Its Objectives"; Lachlan MacLeay, of St. Louis, Mo., President of the Mississippi Valley Association, on "The Valley Authority Issue"; Henry Miller, Director, Trade Practice Division, Federal Trade Commission, Washington, D. C., on "The Trade Practice Conference"; George W. Gagel, President of Machinery & Supplies Company, Kansas City, Mo., on "A Member Speaks"; John H. Gorman, President, Tractors, Inc., Providence, R. I., on "Let's Face the Facts of Surplus Disposal"; George H. McKean, Chief of Materials Disposal Section, U. S. Maritime Commission, on "Surplus Disposal by the U. S. Maritime Commission"; by Colonel John S. Cooke, Vice-President of the War Assets Corporation, Office of Consumer Goods, Washington, D. C., on "Property Disposal Policies and Problems"; and Lt. Com. John Davis Lodge, U. S. N. Ret., of Westport, Conn., on "What the Returning Service Man is Hoping to Find."

Officers of A.E.D. for 1946 are: F. B. McBath, President; William A. Danner, of Parker, Danner Co., Hyde Park, Mass., Executive Vice-President; A. F. Garlinghouse, Garlinghouse Brothers, Los Angeles, Vice-President; C. F. Halladay, Western Material Company, Sioux Falls, S. D., Vice-President; Walter J. Kane, Kane-Gibb-Marr Company, Winnipeg, Manitoba, Canada, Vice-President; W. W. Bucher, R. E. Brooks Company, New York, N. Y., Treasurer; Carol F. Winchester, Washington, D. C., Executive Secretary.

Messrs. McBath, Danner, Garlinghouse, Halladay, and Kane, are newly-elected A.E.D. national officers, as well as being regional directors of the geographical areas of the United States and Canada into which A.E.D. membership is grouped.

A.E.D. Regional Directors for 1946 are:

Region 1—William A. Danner, Parker, Danner Co., 25 Factory St., Hyde Park 36, Mass.

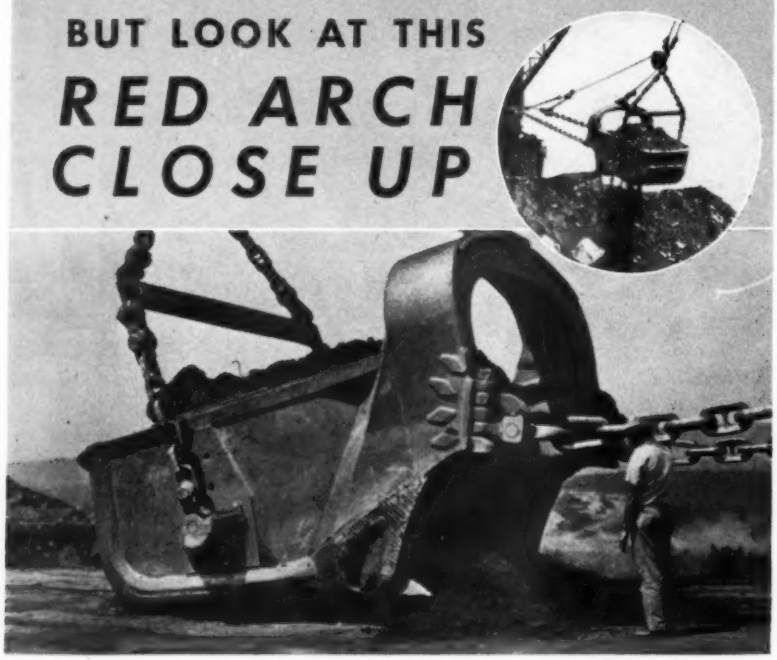
Region 2—Harry J. Hush, Griffin Equip. Corp., 881 E. 141st St., New York 54, N. Y.

Region 3—Geo. N. Crawford, G. N. Crawford Equip. Co., P. O. Box 4039, Pittsburgh, Pa.

Region 4—Robt. H. Carter, Virginia Tractor Co., P. O. Box 1638, Richmond, Va.

Region 5—Albert E. Hahnan, Trac-

LOOKS SMALL AT A DISTANCE—
BUT LOOK AT THIS
RED ARCH
CLOSE UP



From far away, even a 25-yard Red Arch bucket looks small, but when you look at the close-up you can see its true proportions.

And you can see more than that, too. You can see the heaped load that's so typical of every pass with a Red Arch, from ⅜-yard on up. You can see the strong, long-life construction that means long "non-stop" use before there's any need for reconditioning. You can see the high arch that permits loads to flow in and out of the bucket easily for fast digging, quick clean dumping. And you can see the smooth, balanced design that means so much to speeding up the digging cycle.

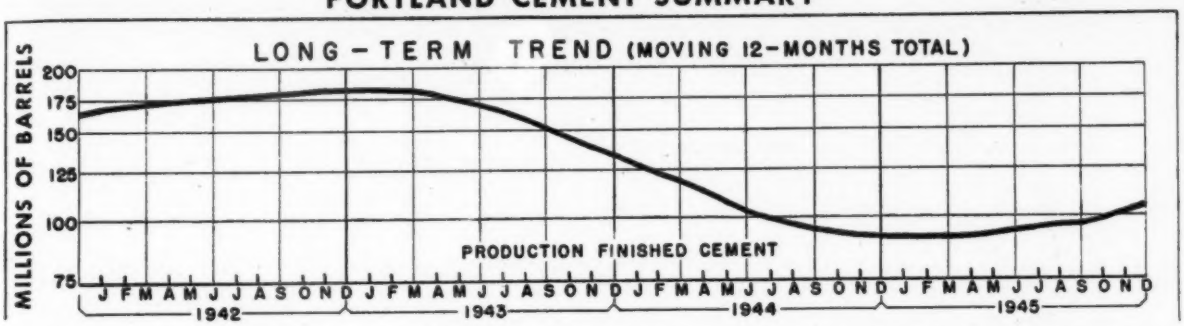
Red Arch buckets are built in three types for light, medium, or heavy digging. Write for information on the size and type you need.

3945

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

PORTLAND CEMENT SUMMARY


LONG - TERM TREND (MOVING 12-MONTHS TOTAL)
MILLIONS OF BARRELS
200
175
150
125
100
75
PRODUCTION FINISHED CEMENT
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1942
1943
1944
1945

tor & Machy. Co., 351 Whitehall St., S.W., Atlanta, Ga.

Region 6—J. C. Williams, W. W. Williams Co., 835 Goodale Blvd., Columbus 8, Ohio.

Region 7—Geo. W. Swart, Contractors Machy. Co., 530 Monroe Ave., Grand Rapids, Mich.

Region 8—C. F. Halladay, Western Material Co., 523 E. 14th St., Sioux Falls, S. D.

Region 9—James W. Bell, James W. Bell Co., 903 17th St. N.E., Cedar Rapids, Iowa.

Region 10—H. L. Burleson, Browning-Ferris Machy. Co., P. O. Box 57, Dallas, Texas.

Region 11—A. F. Garlinghouse, Garlinghouse Bros., 2416 E. 16th St., Los Angeles, Calif.

Region 12—Frank G. Connelly, Connelly Machy. Co., P. O. Box 2122, Billings, Mont.

Region 13—W. G. Clark, Tri-State Equip. Co., P. O. Box 2681, Memphis, Tenn.

Region 14—W. A. Norris, Wortham Machy. Co., 517 W. 17th St., Cheyenne, Wyoming.

Region 15—Walter J. Kane, Kane-Gibb-Marr Co., 701 Henry Ave., Winnipeg, Manitoba, Canada.

AGC Holds Twenty-seventh Annual Convention

The Associated General Contractors of America heard guest speakers, association officers and members discuss problems related to getting a large volume of construction under way in 1946 as rapidly as possible at its 27th annual convention in Chicago, Feb. 18-22.

This was the first convention since 1942 to which it was possible to invite the full association membership. Membership of the national association now includes more than 3,300 leading contractors throughout the country.

Delaware Needs $4,327,000 to Match Federal Aid

A warning that Delaware will lose $4,327,000 in federal aid highway funds unless the state matches this sum with a similar amount before June 30, 1947, was given by W. W. Mack, chief engineer of the State Highway Department, in his annual report.

A $5,000,000 bond issue for financing postwar highway construction was proposed but rejected during the 1945 session of the Delaware Legislature. Next regular session of the Delaware Legislature is not scheduled to convene until January, 1947.

Mack said that federal appropriations to which he referred must be matched with state money and placed under agreement within one year after the end of the war emergency or they would revert to the general fund of the federal treasury. Delaware's Legislature provided $900,000 for construction for each of the fiscal years ending June 30, 1946, and June 30, 1947, he said, adding that this total of $1,800,000 was less than half the amount needed to meet the federal allotments, to say nothing of providing for resumption of improvement of earth roads.

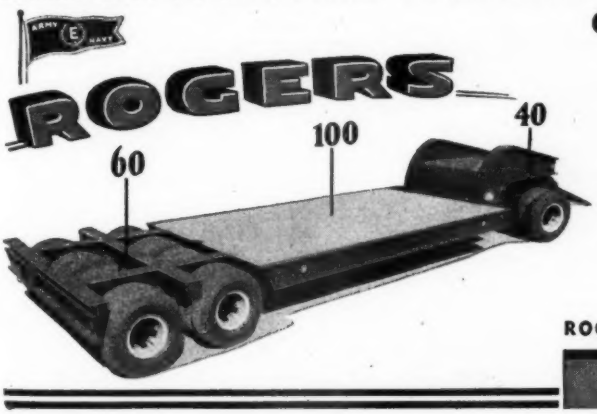
Mack explained that of the $4,327,000 federal funds, $2,295,000 represents funds appropriated for the years 1941-42-43 but not placed under agreement due to a lack of state funds, as well as to wartime restrictions. "The remainder of the money, amounting to $2,032,000," he said, "is the first year's allotment of the three-year postwar highway program and likewise must be matched with state funds and placed under agreement within one year after the close of the fiscal year during which the war emergency terminates."

The chief engineer's report noted that less highway construction work was carried on in Delaware during the last fiscal year than for any year in the history of the State Highway Department because of the scarcity of men and materials, and due to wartime restrictions.

Recommending that a $5,450,000 road construction program be authorized for the fiscal year ending June 30, 1946, he reported that a total of $170,000 of this work had been completed and that contracts had been let for $1,260,000 of the program.

His report emphasized the need for reconstruction and improvement of existing highways before the creation of new ones of a more elaborate and advanced design. "Suspension of highway construction for nearly five years," he said, "has made urgent the immediate repair and modernization of ex-

(Continued on page 150)



Contribute to Unusual Performance

ROGERS TRAILERS are so designed as to carry 60% of the load on the rear unit and 40% on the tractor.

This provides the necessary traction—distributes the load properly over all tires —and greatly improves the haulability and brakeability of both tractor and trailer.

ROGERS BROTHERS CORP. ALBION, PENNA.

EXPERIENCE builds ROGERS PERFORMANCE tells

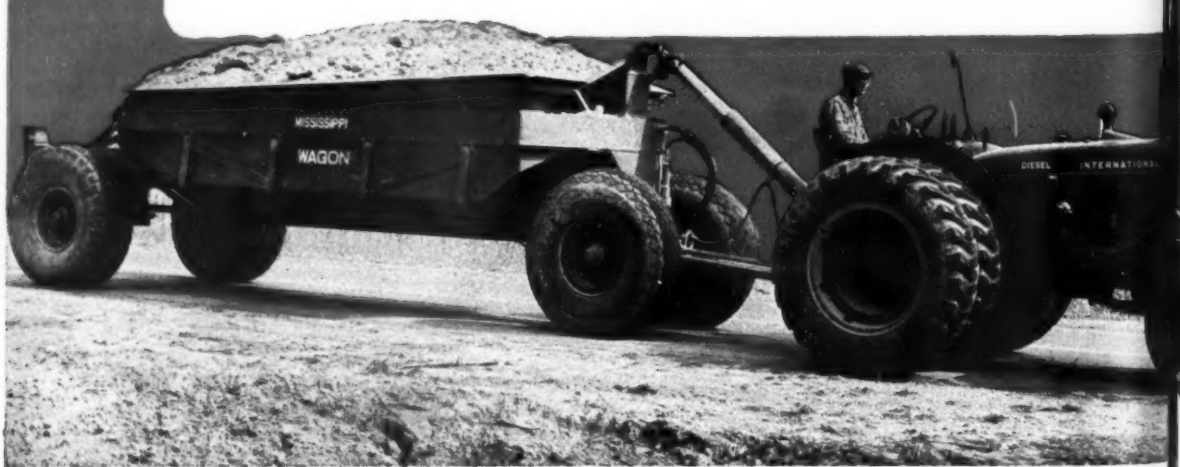
Claims Are More Than Cl
They're Backed By Proof Like

Here are some of the claims we make for MISSISSIPPI WAGONS

Check each of these statements against the owner report opposite . . . one of the many we have received testifying to the economy and versatility of Mississippi Wagons. Performance records like this are your guarantee that Mississippi Wagons have what it takes to handle your hauling jobs, at costs that will assure you of maximum profits.

1. **Since the tractor is not subjected to the pounding and surging of the loaded trailer, a minimum of repairs are necessary during the life of the unit, resulting in more actual operating hours per month or year and in greatly decreased repair expense.**
2. **Repair parts are low in cost. The list price of all gears, bearings and shafts in the five-speed transmission is only $188.99; of all wearing parts in the rear axle and differential, only $315.95.**
3. **Short or long hauls, on or off the highway—it's all the same to versatile Mississippi Wagons.**
4. **The Mississippi Wagon is the only bottom-dump unit powered by a long-life industrial tractor that can haul payloads of 27,000 pounds over highways without exceeding the 18,000-pound axle-loading limit set by most state laws.**
5. **Mississippi Wagons provide greater flotation than semi-trailer units of the same capacity and will therefore travel over spongier ground. For the same reason, they will travel over black-top and other types of pavement without damage to the road surface.**

M-R-S MANUFACTURING COMPANY, Jackson, Mississippi



s, When

his!

Write us, or consult your nearest distributor, for full information on Mississippi Wagons and recommendations as to which type or types will serve you most profitably.

E. R. MORRIS — H. M. YOUNG, JR.

MORRIS & YOUNG
CONTRACTORS
La. Nat'l. Bank Bldg.
BATON ROUGE, LA.

September 12, 1945

Dunham-Pugh Company
Baton Rouge, Louisiana

Gentlemen:

I am pleased to give you the information requested on the four Mississippi Wagons we purchased from you on July 11, 1944.

During the first fourteen months we have owned these four Mississippi Wagons we have operated them approximately 3490 hours per unit with a repair parts bill of $1099.87 on the tractors and $181.65 on the trailers--a total of $1281.52 for the four units, or $320.38 for each unit.

In other words, our repair parts costs have been 9 and 18/100 cents an hour per unit, and the units are still in good operating condition, using about the same amount of fuel and oil they have always used.

During this fourteen months we have hauled the following quantities of material for the distances shown:

240,000 yards of dirt	average haul	½ mile
42,000 yards of gravel	average haul	8 miles
28,000 yards of gravel	average haul	10 miles
18,000 yards of shell	average haul	5 miles

We are now back on our dirt job at Lottie, Louisiana, finishing it up. Last winter's rains made it necessary for us to leave it as the ground conditions were quite bad, since the water level is only five feet underground on the job site.

It was very pleasing to us to have hauling equipment that permitted our taking contracts for gravel and shell hauling during those winter months, instead of having to scatter our organization and let our equipment stand idle.

In addition to their low maintenance cost and their suitability for both on or off the highway use, we are very pleased with the ability of our Mississippi Wagons to work under soft ground conditions, and with their ease of handling, operator comfort and simplicity.

I trust the above gives you all of the information requested.

Very truly yours,

MORRIS & YOUNG, CONTRACTORS

E. R. Morris

ERM/J

E. R. Morris

MISSISSIPPI WAGON

The World's Most Modern Hauling Unit

Shots from the Firing Line

(Continued from page 147)

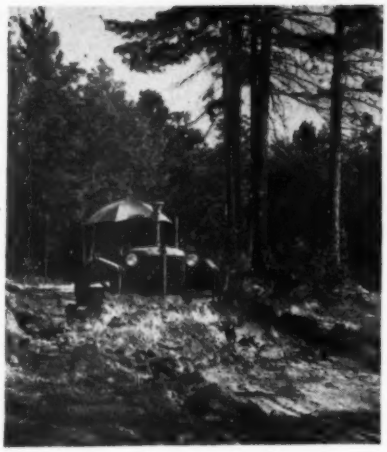
isting main highways, before the newer developments can take place, for there are not sufficient funds, either state or federal, to carry on the two programs at the same time."

Start Construction of Maine Turnpike this Spring

Completion of the sale of $15,000,000 in bonds by the Maine Turnpike Authority assures the start this spring on construction of the Kittery-to-Portland section of the Maine Turnpike, it was announced by Gov. Horace A. Hildreth.

To be financed by tolls, the turnpike can eventually extend from Kittery to Fort Kent under authority granted by the 1945 Maine Legislature. The bond prospectus described the Kittery-to-Portland section as an express highway approximately 45 miles long between the two cities located generally parallel and west of U. S. Highway No. 1. Pavement will be 24 feet wide, with a minimum 26-foot center strip and 10-foot shoulders. The most modern type construction will be used, meeting design standards for the National System of Interstate Highways.

Prepared by Coverdale & Colpitts, New York engineering firm, the prospectus estimated that tolls ranging from 50 cents for passenger cars to $1.50 for semi-trailer trucks, will produce $564,000 in revenue in the first year. It was further estimated that revenues will increase to $733,000 by 1948, plus $15,000 from concessions, or a total of $748,000 by 1948. Revenues from 1948 through 1970, it was estimated, will total $24,840,000, which was described as sufficient to meet all interest payments operating expenses and funds to pay off the entire bond issue.



• This rustic site will be a housing subdivision. Road being built by an Allis-Chalmers HD-7 tractor with Gar Wood bulldozer.

Award Contract for Section of Coachella Canal

A $1,228,841 contract for construction work on a ten-mile section of the 145-mile Coachella irrigation canal in southern California has been awarded to the Shea Company and the Morrison-Knudson Company, both of Los Angeles.

Eighty-four miles of the Coachella Canal have been completed, approximately eleven miles are under construction, and this new contract covers earthwork, concrete lining, and structures for an additional ten miles of the canal due east of Indio, California. The Bureau of Reclamation expects to advertise for bids for additional mileage in the near future.

The Coachella Canal is a branch of the 80-mile All-American Canal completed by the Bureau of Reclamation in 1940. With an initial capacity of 15,155 second-feet, the All-American is the largest man-made river in the world. It provides irrigation for 500,000 acres in the Imperial Valley of California.

The Coachella Canal, designed for an initial capacity of 2,500 second-feet, will irrigate approximately 75,000 acres in the Coachella Valley, south of Indio, California, and north of the Salton Sea. Water for the All-American Canal system is diverted from the Colorado River by the Imperial Dam which is about 18 miles upstream from Yuma, Arizona. Imperial Dam was constructed by the Bureau of Reclamation in 1938.

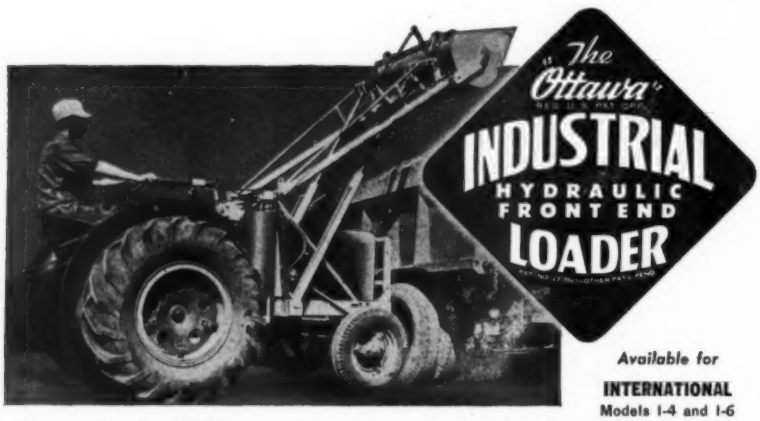
Construction operations on the Coachella Canal were suspended at the outbreak of war, but were resumed on a limited basis under War Production Board authorization in 1944. Since the end of the war, construction of the canal has been resumed in full vigor. The Bureau's work schedule calls for the earliest possible delivery of water to the areas threatened by water shortage on the west side of the Coachella Valley, Commissioner Michael Straus said.

Resume Dredging Delaware River Channel

Dredging of the Delaware River Channel has been resumed, according to recent announcement by the Army District Engineer's office in Philadelphia, which said that the work would be speeded up following the completion of the construction of additional dredges.

The Delaware River dredging had been interrupted by the war. The projected depths call for a 40-ft. channel between the Delaware Bay and the League Island Navy Base and a 37-ft. channel in the Philadelphia harbor.

During the war emergency several



Lifts 3,000 Pound Load 8 Feet

The "Ottawa" INDUSTRIAL Hydraulic Front-End LOADER is a HEAVY DUTY Machine . . . it lifts 3000 pounds of Sand, Gravel, Rock, Coal, Steel Pipe, Dirt or Other Bulk Materials to a height of 8 feet quickly and easily . . . it assures operator perfectly CLEAR VISION at all times, is quickly and simply ATTACHED or DETACHED and is SHIPPED COMPLETE (there's absolutely nothing additional to buy or add) with complete HYDRAULIC SYSTEM including pump and valve. Bulldozer blade, Snowplow and Boom attachments are available. Write or wire today for FREE ILLUSTRATED FOLDER and prices. Immediate shipment.

Available for

INTERNATIONAL
Models I-4 and I-6

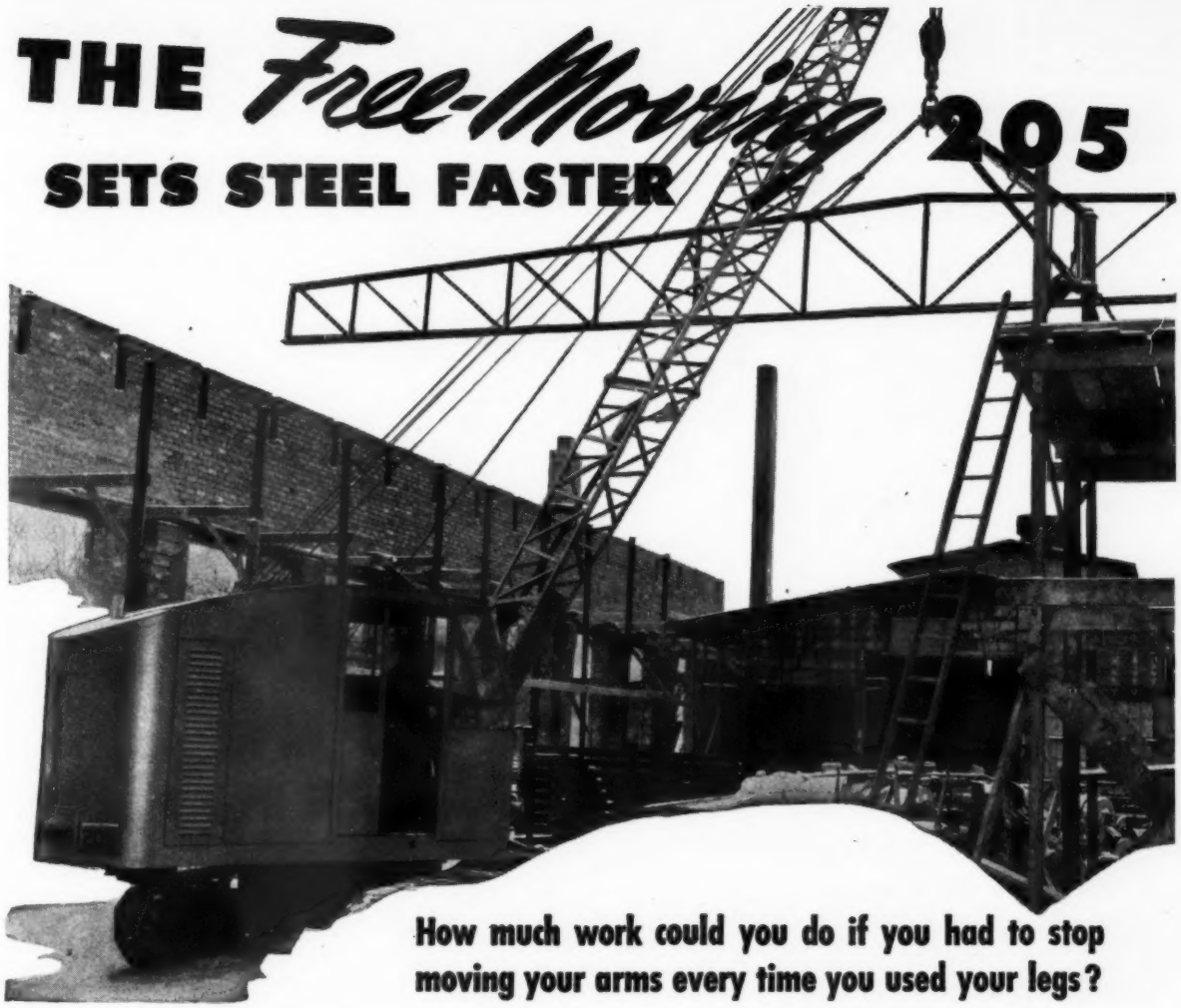
ALLIS-CHALMERS
"WC" with wide front wheels

OLIVER
"70" Industrial

MINNEAPOLIS-MOLINE
"RTI" and "UTI"

Ottawa STEEL PRODUCTS, Inc.
OTTAWA 11, KANSAS

THE *Free-Moving* 205 SETS STEEL FASTER



How much work could you do if you had to stop moving your arms every time you used your legs?

On the Koehring 205, traction is free, independent of all other operations. A separate, individual lever controls forward and reverse travel.

You can swing while you move, raise or lower the boom while you move, hoist while you move. You can travel, swing, hoist, raise or lower the boom—all at the same time. No need to stop any other operation in order to move.

Twenty-five per cent greater maneuverability means greater production per day on any operation, but particularly in setting steel. With the Koehring 205, it's off the storage pile fast, up to where the riveters are waiting in one continuous, unbroken move. Then inched into place more swiftly, because *ALL* operations—travel, swing, hoist and boom hoist are available in any desired combination or simultaneously.

205 Crane Facts

Available as Crawler Crane, Truck Crane or One-Man Operated Rubber-Mounted Cruiser Crane.

Lifting Capacities:

10' Crawlers, 16" Shoes: (10' radius, 30' Boom, 75% Rating) . . . . . 13,800 lbs.

11'-5" Crawlers, 24" Shoes: (10' radius, 30' Boom, 75% Rating) . . . . . 15,500 lbs.

Cruiser: (12' Radius, 30' Boom, 85% Rating) . . . . . 14,500 lbs.

Truck: (12' Radius, 30' Boom, 85% Rating) . . . . . 20,000 lbs.

Booms: 30' length standard. Additional segments in 5' and 10' lengths.

Clutches: Smooth acting inside band type.

Power Lowering Device: Optional.

KOEHRING HEAVY DUTY — ARMY E NAVY

KOEHRING COMPANY
MILWAUKEE 10, WISCONSIN

HEAVY-DUTY CONSTRUCTION EQUIPMENT

of the Delaware River dredges, as well as a bulk of the manpower of the Philadelphia district office, were assigned to other ports, including foreign ports after the invasion. Under the circumstances the channel was maintained at an average depth of little more than 37 feet.

Four dredges were working on the project at this writing. Four additional dredges, costing $4,250,000 each, were under construction.

Although none of the new dredges is to be assigned to Philadelphia, it was explained, as soon as they are put in service two dredges which have been working in other ports will be assigned to Philadelphia so that six dredges will be permanently employed dredging and maintaining the Delaware River channel.

Work Started on Bull Shoals Dam in Arkansas

Some work has started on the $47,000,000 Bull Shoals dam which is to be built across White River about ten miles west of Mountain Home, Arkansas. Congress appropriated $2,750,000 early in January for use in the project.

Army engineers estimate that peak of production will not be reached until June, 1947. They are making Mountain Home their headquarters.

Housing for some 3,700 workers is a problem that is being worked out by the North Arkansas towns as they struggle to build tourist courts and increase the capacities of city water plants and sewage systems.

Cotter, Ark., will be the rail head for the project.

• Bucyrus - Monighan dragline with 6-cu. yd. bucket works on section of Friant-Kern Canal in California's San Joaquin Valley.
Authenticated News Photo

Plan Flood Control Projects In Shreveport Area

Flood control projects are to be started soon in the Shreveport, La., area. Bodcau Reservoir and Wallace Lake Dam are to be completed and the Red River bank stabilization program will start when the present high water has receded.

Announcement that bids would soon be advertised on this work was made in Shreveport by Major-General R. W. Crawford, division engineer, Vicksburg, Miss., at a meeting of the Red River Valley Improvement Association.

Bodcau Dam, which will be located two miles northeast of Bellevue, will be a flood control dam only, consisting of a rolled earth fill 11,400 feet long with a 4,000 foot concrete spillway and a pool area of 21,000 acres, which will measure 28 miles long and about one mile wide at Cotton Valley. Engineers estimate it will control any floods of which a record has been kept.

Highway Association Elects Minnesotan President

M. J. Hoffman, chairman of the Minnesota highway Commission, was elected president of the American Association of State Highway officials, at the close of the annual convention in Oklahoma City, Oklahoma, February 1.

One of the final acts of the convention was the passing of a resolution calling upon the federal government to release to the various states immediately some 24,000 units of surplus equipment to be used in road construction.

Dewey Wants Toll Charge Dropped from Super-Highway

The original plan to pay for the proposed thruway from New York to Pennsylvania from tolls levied on motor vehicles which use the super-highway has been changed and the financing, amounting to $202,000,000 will come

Wise-up on the Load Lugger

All material handling jobs, where loading is done by hand labor, are a "natural" for the Load Lugger.

Built for sturdy, speedy service with hydraulically operated booms, driven through a power take-off from the motor.

Continuous operation, loading and dumping buckets as fast as filled. No time lost by idle trucks waiting to be loaded.

Write for Bulletin

Instead of bemoaning the increased costs of material handling, get wise to the time-saving advantages of a Load Lugger mounted on your truck chassis.

Use several detachable buckets with each unit, spotting them on the job at handy loading points. Only 15 seconds for picking up or dumping the bucket . . . and easily controlled from the driver's cab. Load Luggers help you cut the cost of excavating and hauling, stripping overburden, loading riprap, road building, quarry work and many other operations.

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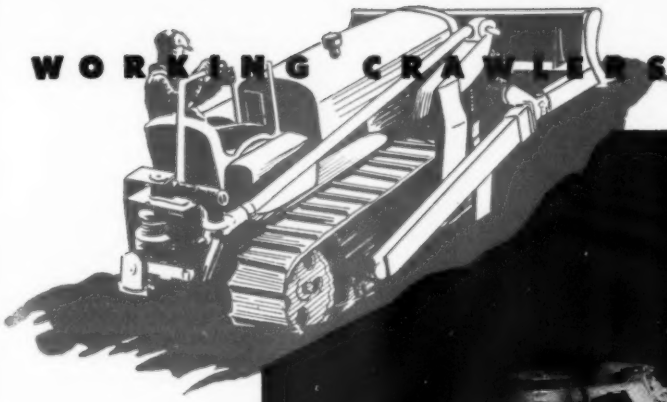

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portable

bad track doesn't mean "days off"

when there's a Rodgers around-

RODGERS CRAWLER TRACK PRESSES

Mr. Contractor

Your dealer probably has Rodgers Track Servicing Presses in his service department for the purpose of helping you maintain your equipment. If he hasn't and your requirements won't justify your having a Rodgers Press of your own, urge him to investigate the savings of a Rodgers. It will pay you both!

You don't need to "retire" your crawler equipment for a couple of days for track maintenance . . . you don't need a gang, or a sledge, or a torch either — no Sir! — not when there is a Rodgers Track Press on or near the job. That's because a Rodgers will service 2 large strings of track in the average machine time of 3 to 4 hours.

A Rodgers has an exclusive feature in the Retractable Jaw which eliminates lifting the track over a stationary jaw and assures proper bearing support against the inner side of the rail, thus properly spacing the rails, eliminating any binding action — leaves tracks flexible after servicing. And the Rodgers Track Wrench is the handy answer to tight, frozen nuts.

You can get a Rodgers Crawler-Track Press in portable models: 2 wheel trailer or 4 wheels; and in stationary shop models. Write now for complete details; or see your crawler equipment dealer — he will tell you what a Rodgers can do to save you time and labor.

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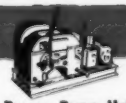

Power Pump Units

Portable Presses

• Equipped with a grapple this Bucyrus-Erie 10-B crane is used at Tomahawk-Craft Paper Co.'s Babbitt, Minn., Camp No. 2 in the heart of Superior National Forest to load pulpwood logs four to eight inches in diameter. The machine handles about 35 loads of eight cords to a truck per nine-hour day. Ten trucks are used on the job.

from revenues of the State. The reason given for the new plan was based on the fact that the estimated fees from highway users would not pay for the road. This was determined from traffic engineering studies made by three different organizations.

The new 482-mile thruway will start in the northern part of New York City, to just west of Buffalo, New York, where it will reach the borderline of Pennsylvania. Work on the super-highway will begin in the spring of 1946 in several places on its route; first at Buffalo, then near Syracuse and with more construction in the Kingston-Saugerties-Catskill region.

Consideration is to be given later to the length of time required to complete the highway and whether a bond issue will be needed to partially finance construction costs.

Support the Red Cross—1946

Arkansas Overhauling Its Road System

Arkansas is overhauling its road system. Bills have passed both houses of the state legislature to set up a 4400-mile farm-to-market road system and authorize issuance of $30,000,000 worth of highway bonds.

The Senate has passed a bill which allows counties $5,000,000 to be used as "match money" against half of a $10,000,000 federal grant to aid farm-to-market roads.

Another bill being considered is one that would repeal an act that requires the highway commission to repay counties for roads taken over as a part of a hard-surface road system. There is considerable litigation around this point and passage of this legislation would solve the problems, it is reported.

Jacobsen Heads Intermountain Branch of AGC

Ted C. Jacobsen, Salt Lake City, was elected president of the Intermountain Branch, Associated General Contractors of America, at its recent two-day convention in Salt Lake City. He succeeds Joseph W. Grant of Springville, Utah.

Grant Thorn of Springville was elected vice president, and J. H. Tempest Sr., Salt Lake City, was reelected secretary-treasurer. Named new members of the board of directors were Frank B. Bowers of Salt Lake City and Carl E. Nelson of Logan, Utah.

No Conflict In Highways and Housing

Highway construction and the housing program can go along together in 1946 without competition for critical materials, according to a study of six groups of building materials by the Federal Works Agency.

The survey shows that highway building will consume either none or only negligible quantities of the materials in question. Housing needs the following in 1946: 160,000 tons of cast iron soil pipe and fittings; 1,840,000,000 unglazed brick; 250,000,000 feet of gypsum board; 140,000 tons of structural

clay tile and 6,500,000 board feet of lumber in addition to millwork and flooring. Highways' only requirements in these materials are practically no soil pipe, about 1 percent of the total production of brick and some 1 percent of total lumber production.

Atomic Factory Required Million Dollars Worth of Clay

An estimated million dollars worth of clay pipe and other clay products were used in building the atomic bomb factories and housing facilities for 75,000 operational and construction employees at Oak Ridge, Tenn., according to a report issued recently by H. C. Maurer, president of National Clay Pipe Manufacturers, Inc., representing 44 clay pipe manufacturers across the Nation.

To give an idea of the tremendous amount of construction work required to build this "greatest secret of the war," Maurer pointed out that approximately 25,000 tons of clay products were used in factory buildings and in various types of housing and sewerage facilities.

Dimension Stone in 1944

The output of dimension stone (exclusive of slate) in the United States in 1944, as reported by producers to the Bureau of Mines, United States Department of the Interior, totaled 618,620 short tons valued at $14,854,816, a decrease of 26 per cent in quantity and increase of 11 per cent in value compared with 1943. This total includes all dimension stone sold or used for rough construction, cut stone, slabs, mill blocks, rubble, monumental purposes, paving blocks, curbing, and flagging.

Under normal conditions, dimension stone is used extensively as a building stone, particularly for public buildings of all kinds. The erection of such buildings ceased when the industry and manpower of the nation turned to the problem of winning the war, and sales of dimension stone for building dropped still further in 1944—to 2,529,650 cubic feet valued at $2,768,993, a decrease of 35 per cent in quantity and one per cent in value compared with the all-time low of 1943. Sales of rubble, also classed as a building stone, but not included in the above total for dimension building stone, decreased 47 per cent in quantity and 43 per cent in value.

Memorial stone production, which is an important branch of the granite and marble industries, has been maintained at relatively high levels. Sales of stone for monumental purposes amounted to 2,940,150 cubic feet valued at $11,396,526 in 1944 compared with 2,541,080 cubic feet valued at $9,731,521 in 1943, an increase of 16 per cent in quantity and 17 per cent in value.

Paving blocks sold in 1944 increased one per cent in number but decreased 33 per cent in value and 46 per cent in tonnage compared with 1943. A higher proportion of the 1944 output consisted of small blocks.

Sales of curbing rose to 207,060 cubic feet valued at $194,272 in 1944, an increase of 40 per cent in quantity and 13 per cent in value over 1943. Flagstone sales decreased 37 per cent in quantity but increased 17 per cent in value.

Summarize Future Work in Pacific Northwest

With a $20,000,000 supplemental appropriation and unexpended balances of $17,000,000 in regular appropriations available, the Bureau of Reclamation plans immediately to launch an accelerated construction program on irrigation and multiple-purpose projects in the Pacific Northwest, according to Regional Director R. J. Newell.

Construction will be resumed or stepped up on nine projects in Idaho, Oregon, Washington, and western Montana, and investigations will be rapidly advanced to make early construction possible on two other major authorized projects, he declared.

The projects on which construction will be intensified are: Deschutes in central Oregon, Vale in southeastern Oregon, Owyhee in southeastern Oregon and southwestern Idaho, Anderson Ranch and Cascade Dams in southwestern Idaho, Minidoka in southeastern Idaho, Post Falls Unit of the Rathdrum Prairie Project in northern Idaho, Roza

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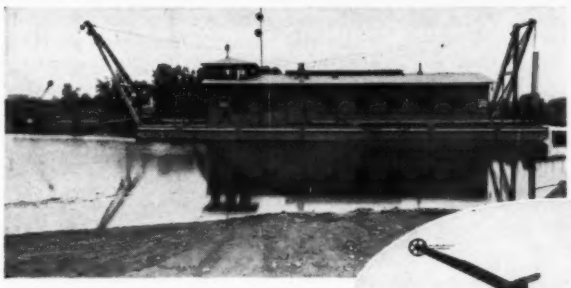

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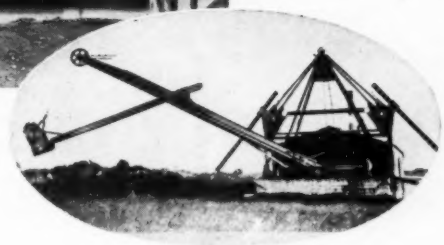

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Every ASD dredge is designed as a complete, integrated unit for economical performance. Backed by 40 years of dredge building experience, these units are cutting yardage costs on many different projects — canals, harbors, channel improvements, drainage, sand, gravel, fills, ore recovery and other jobs.

Patented, bolted sectional steel hulls, all machinery and accessories are shipped by rail, truck or as hold cargo for assembly at site of use. May be dismantled, shipped and reassembled at remote inland locations.

Write for catalog, photos and data sheets.

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• Working in a little side canyon, 150 feet above the floor of Mandeville Canyon, this International TD-14 tractor and Bucyrus-Erie bulldozer is doing a land-clearing job for Mrs. Esther Sterkin who proposes to grow tuberous begonias, gardenias, and orchids. She said the correct temperature prevails in this canyon, one mile north of Sunset Blvd. and six miles west of Hollywood, to grow these flowers without hothouses. The floor of this canyon is an acre in size. A terrace four feet high was built around this canyon.

Division of the Yakima Project in south central Washington, and the Columbia Basin Project in eastern Washington. The approved projects on which investigations will be pushed are Palisades in southeastern Idaho and Hungry Horse in Western Montana.

The funds provided by Congress for the expanded Reclamation activity consist of a supplemental appropriation of $20,263,000 for the current fiscal year, made available late in December, a regular appropriation of $10,425,000, granted last summer, and an unexpended balance on June 30, 1945, of $6,511,452.

The following work is contemplated under the Bureau's immediate postwar program for the Pacific Northwest:

OREGON

Deschutes Project

All phases of work on the Deschutes Project in central Oregon looking to the delivery of water next spring to approximately 20,000 of the 50,000 acres to be irrigated in the North Unit will be pushed with a supplemental appropriation of $1,000,000 plus unexpended balances of $2,035,584 made available for this purpose through regular appropriations. This program will include continuing construction of Wickiup Dam and clearing of the reservoir to permit using the full storage capacity, initiating channel improvement work on the Deschutes River, completing the main canal system for the initial 20,000 acres, completing work on lateral and sublateral canals in this area, and initiating construction of the main canal and laterals for the remaining 30,000 acres in the North Unit, some of which the Bureau hopes to be able to serve with water in 1947.

Owyhee Project

On the Owyhee Project (Oregon-Idaho), the Bureau will construct a wasteway for the North Canal. Two wasteways were provided for in the original construction, but one was destroyed in an earth slide and the other cannot be operated at full capacity because of developments along the channel to the river. Rehabilitation of pumping plants originally installed by the Gem and Ontario-Nyssa irrigation districts and of laterals constructed by these districts is also planned. A supplemental appropriation of $190,000 is available for this work and the unexpended balance on June 30, 1945, was $59,145.

Vale Project

The supplemental appropriation of $3,000 made available for the Vale Project in eastern Oregon will be expended in the construction of laterals to serve an additional 1,000 acres of land and in constructing drains to relieve water-logging in a small area.

IDAHO

Minidoka Project

With the $720,000 supplemental appropriation made available for the Minidoka Project in southeastern Idaho, the Bureau hopes to make improvements in the 70-mile long Milner-Gooding Canal, which has been leaking excessively. The program will include construction of laterals and possibly lining of initial sections of the canal with gravel and earth. It is estimated that when this work has been completed,

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Gives smooth working surface and most efficient weight distribution for balance and greater digging efficiency. Stronger and longer-lived because of solid, heavy plate construction.

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Larger diameter sheaves, with fully sealed needle roller bearings instead of bronze bushings, reduce power loss by friction, deliver full power to cutting edge, combine to provide faster, smoother operation.

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⅜ to 2½ yard sizes. General Purpose, Wide Rehandling and Heavy-Duty Digging Type.

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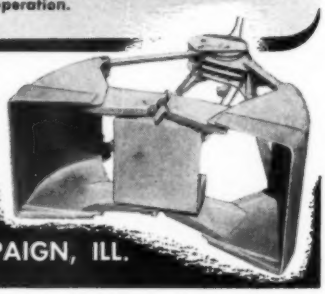

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STANDARD ENGINEERS NOTEBOOK

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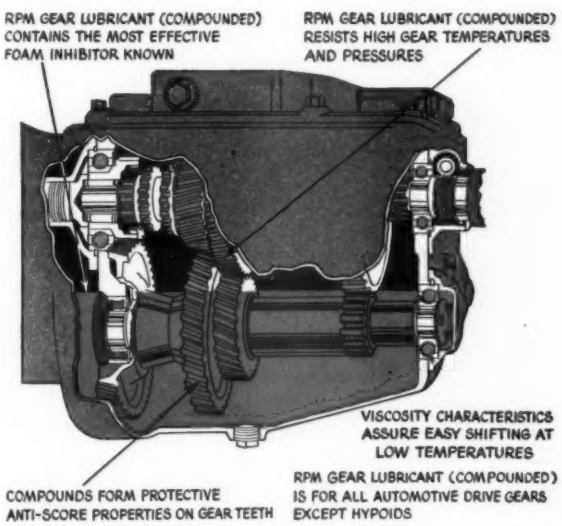
Many operators of automotive equipment have eliminated transmission and differential trouble by switching to RPM Gear Lubricant (Compounded). It is recommended for all transmissions and all conventional differentials. (RPM Hypoid Lubricant should be used in hypoid differentials.)

The compounds in RPM Gear Lubricant assure that a tough, oily film will remain on gears when pressure and heat become excessive. A highly effective foam inhibitor prevents retention of air in lubricant, poor distribution and "boiling up" to cause leaks.

RPM Gear Lubricant (Compounded) is non-corrosive. It comes in four grades: SAE 80, 90, 140, 250.

For complete information about automotive drive gears and their lubricants, write for the new, free booklet: "The Lubrication of Automotive Gears."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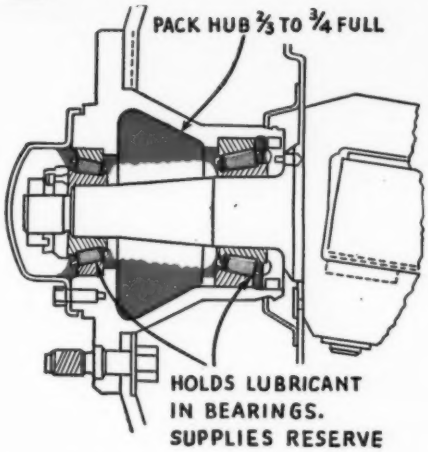
RPM GEAR LUBRICANT (COMPOUNDED) IS FOR ALL AUTOMOTIVE DRIVE GEARS EXCEPT HYPOIDS



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Because RPM Wheel Bearing Grease absorbs the countless shocks on wheel bearings, and stays put in extreme temperatures, it will prolong the life of properly adjusted wheel bearings.

RPM Wheel Bearing Grease is specially made for wheel bearings — both the roller type and the ball type. It will not throw out and melt unduly even in hot weather. In any weather it feeds in the proper amounts onto all parts of bearings providing a uniform, tough lubricant film. The resiliency of this film reduces vibration that might rack wheel bearings and steering gear assemblies.

Water resistant, RPM Wheel Bearing Grease helps bearing seals keep out moisture. It seals out grit and dust, too.

For complete information, write for the free booklets, "How To Service and Lubricate Wheel Bearings." There's one for heavy-duty trucks and trailers and one for light equipment.

For additional information and the name of your nearest Distributor, write Standard of California, 225 Bush Street, San Francisco 20, Calif.; The California Oil Company, 30 Rockefeller Plaza, New York 20, N. Y.; The California Company, 17th and Stout Streets, Denver 1, Col.; Standard Oil Company of Texas, El Paso, Texas.

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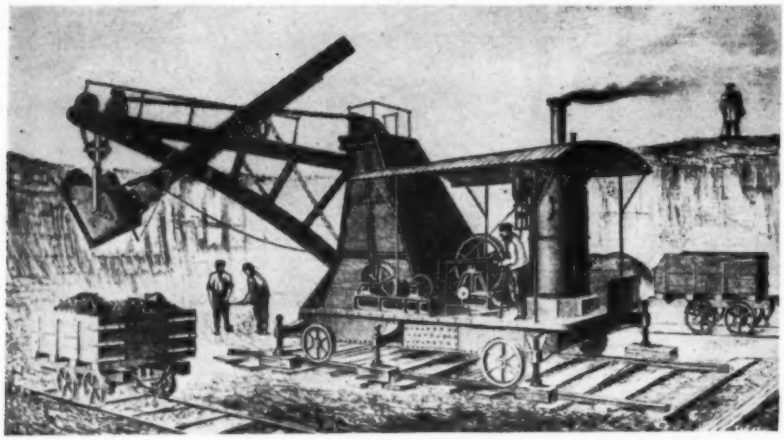

• This steam shovel of 1877 was said to have been capable of excavating and filling rail wagons at the rate of 60 cu. yds. per hour.
The Bettmann Archive

sufficient water will be conserved to irrigate approximately 18,000 acres north of Hazelton and Eden. The Bureau hopes that completion of the initial lining, together with the construction of secondary laterals, will permit delivery of a water supply to 5,000 acres in this area by the spring of 1947. No regular appropriation was made for this project.

Palisades Project

The investigation program on the Palisades Project, situated near the Idaho-Wyoming border, which has been under way for approximately a year, will be carried forward as rapidly as possible with the additional $1,000,000 made available by Congress last month. This will lead to actual construction at the earliest opportunity. The dam will provide a full supply of water for a block of new land and supplemental supply for a large area in the Upper Snake River region, produce a sizable block of hydroelectric power, and provide flood control benefits. In addition to the supplemental appropriation set aside for the work at Palisades, $450,000 is available from the regular appropriation. On June 30, 1945, the unexpended balance was $213,000.

Cascade Reservoir and Pumping Division, Boise Project

Resumption of construction of the Cascade Reservoir and Pumping Division in southwestern Idaho, which was halted by the war, is being expedited. The project will provide a full supply of water for 25,000 acres of new land and a supplemental supply for 83,750 acres of irrigated land now subject to periodic shortages. Initial survey parties are already in the field and bids for the Cascade Dam, a 90-foot high earth- and rock-fill structure, will be called for this month. A call for bids will also be issued soon for completing the relocation of a portion of the McCall Branch of the Union Pacific Railroad. Relocation of 11½ miles of highway is scheduled to begin next spring. Considerable other work, including construction of a major pumping plant and lateral systems, also is contemplated. An unexpended balance of $1,494,954 and a $2,000,000 supplemental appropriation are available for this work.

Anderson Ranch Dam, Boise Project

Construction of Anderson Ranch Dam, near Boise, which has progressed to a point where approximately 80,000 acre-feet of water can be stored next spring to provide a supplemental supply for the Boise Valley, will be advanced at maximum speed under the current program. A total of $3,000,000 was made available for this work in the regular appropriation bill and $1,925,000 was granted in the supplemental measure. The work program will include adding additional earth, gravel, and rock to the 5½ million cubic yards of material already in the dam (ultimately it will contain 8,650,000 cubic yards), additional clearing in the reservoir, purchase of additional right-of-way, relocation of roads, initiating construction of a 27,000-kilowatt powerplant and a transmission line from the dam to Mountain Home, Idaho, to furnish irrigation pumping power for the Boise and Owyhee Projects. Plans are also being made to enlarge the outlet works of Arrowrock Dam, downstream from Anderson Ranch Dam, to make flood control operations more effective.

Post Falls Unit, Rathdrum Prairie Project

In northern Idaho, construction will be continued on the Post Falls Unit of the Rathdrum Prairie Project. Facilities will be completed there during the winter to serve the entire 3,500 acres in the unit next spring. No supplemental appropriation was requested as adequate funds were available for this work.

WASHINGTON

Roza Division, Yakima Project

With the 47,000-acre gravity unit of the Roza Division of the Yakima Project in south central Washington sched-

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uled for completion by early summer, the Bureau this spring will initiate construction of pumping facilities to service an additional 25,000 acres in this highly productive area. The supplemental appropriation of $1,650,000, plus what remains of a regular appropriation of $325,000 and an unexpended balance on June 30, 1945, of $251,299, will be used to begin construction of 19 pumping plants. Ten of these are to be completed to serve the best 10,000 acres of land in the vicinity of Yakima, Sunnyside, and Prosser this year.

Also scheduled is the completion of an 11-mile long wasteway for the protection of lower lands and existing farms when irrigation is started on other land, construction of pumping laterals and waste water diversion channels concurrently with the development of the lateral system, construction of 85 miles of transmission lines and substations for serving lands to be developed for irrigation pumping, and other work.

Columbia Basin Project

For the current fiscal year, $18,749,000 was made available for the Columbia Basin. This total includes a regular appropriation of $6,000,000 and a supplemental allotment of $10,275,000. The remainder was unexpended balance. Under the program outlined with the money on hand, the Bureau will begin initial construction of a giant pumping plant and other facilities required to bring water from the Columbia River to the million acres of fertile land to be irrigated.

Approximately $2,000,000 was made available for the purchase of land in the irrigable area from owners who, under the project act, must dispose of excess holdings. Later the land purchased will be divided into family-size units and made available to settlers. Considerable work at Grand Coulee Dam, including the transfer of two 75,000-kilowatt generators to Shasta Dam, from where they were borrowed as a war expediency, repair of the spillway bucket, and construction of industrial facilities, is also scheduled.

WESTERN MONTANA

Hungry Horse Project

With the $1,500,000 made available by Congress in the supplemental appropriation for the Hungry Horse Project, near Kalispell, Montana, and the unexpended balance of the regular appropriation of $200,000, the Bureau of Reclamation will seek to complete all surveys and plans, initiate construction of a paved highway to the dam site, initiate clearing of heavy timber and brush growth from the dam site, lay out a government town site, initiate clearing of the reservoir near the dam site, complete surveys for the relocation of roads and Forest Service facilities, and purchase some right-of-way. Every effort will be made to bring plans to the stage where early construction can be undertaken.

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OBITUARIES

— HAMILTON O. PENN —

Mr. Hamilton O. Penn, president of the H. O. Penn Machinery Company, Inc., New York City, died suddenly January 31 of a heart attack at the Edgewater Beach Hotel, Chicago, where he was attending the 27th annual convention of the Associated Equipment Distributors. Mr. Penn was the retiring president of the Associated Equipment Distributors and had been extremely active through all but the last two sessions of the convention.

Hamilton O. Penn

Mr. Penn was born in Hartland, Wisconsin, September 9, 1896, attended grade and high schools there and then the Milwaukee State Normal College. He spent several years as a construction superintendent. He then went into the manufacturing business associating himself with the T. L. Smith Company of Milwaukee where he became assistant general sales manager.

Early in the 1920s he decided to open his own business in construction equipment in New York City which has been headquarters for his rapidly expanding company, the H. O. Penn Machinery Company, incorporated in 1923. In addition to this main office and warehouse in New York City, branch sales offices and service shops are maintained at Mineola and Poughkeepsie, New York, and Newington, Conn., where complete parts facilities are maintained for many important lines of heavy construction and highway equipment.

Mr. Penn was a director of the Bronx County Trust Company, New York and the Tyson Bearing Corp., of Massillon, Ohio, and a trustee of several boys' clubs. He was a 32nd Degree Mason and a Shriner, member of the Moles and the Bronx Chapter of the Rotary Club; active in all civil affairs, war drives, etc., he had just been named chairman of the Bronx Red Cross Drive less than one month before he died. He served two years as chairman of the Commerce and Industry Committee and was also president of the Carmel Country Club and a member of the New York Athletic Club.

During the early stages of the war, Mr. Penn was called to Washington as Chief of the Used Construction Machinery and Track Type Tractor Sections of the War Production Board and served in that capacity for over one year when setting up the inventory and control for used construction equipment.

He is survived by his wife, Florence C. Penn and daughter, Peggy Ann; father, Orville W. Penn of Hartland, Wisconsin, two sisters, Mrs. Alice Mac Eachern and Mrs. Harriett Hanson, both of Evanston, Illinois, and a brother, Burton J. Penn of Hartland, Wisconsin.

—WILLIAM T. MORRIS—

William Thomas Morris, 62, president of the American Chain and Cable Co., died Feb. 6 in a New York City hospital. His residence was in Great Neck, L. I.

Born in West Pittston, Pa., the son of a coal miner, Mr. Morris went to work in a coal mine when he was 14 years old. After a day and a half of mining he changed his mind and went to New York, where he got a job with an oil company at $6 a week. Besides this job, he worked overtime with the Weed Chain Tire Grip Co., assembling chains until 1904, when he became a shipping clerk with the chain firm. Eight years later, when the American Chain Co. was formed and took over the Weed chain firm Mr. Morris became manager of the Norfolk plant, and in 1919 was made vice president and general manager. In 1936 the company became the American Chain and Cable Co., with Mr. Morris as president.

Mr. Morris also was president and a director of the Michigan Chemical Corp. of St. Louis, Mich.; president and a director of the Continental Development Co. of New York, a director of the Magazine Repeating Razor Co., president and a director of the Sormir Petroleum Corp. and vice president and a director of the American Fabrics Co. of Bridgeport, Conn.

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ONAN ELECTRIC GENERATING PLANTS supply reliable, economical electric service for excavating and contracting uses as well as for scores of other general applications.

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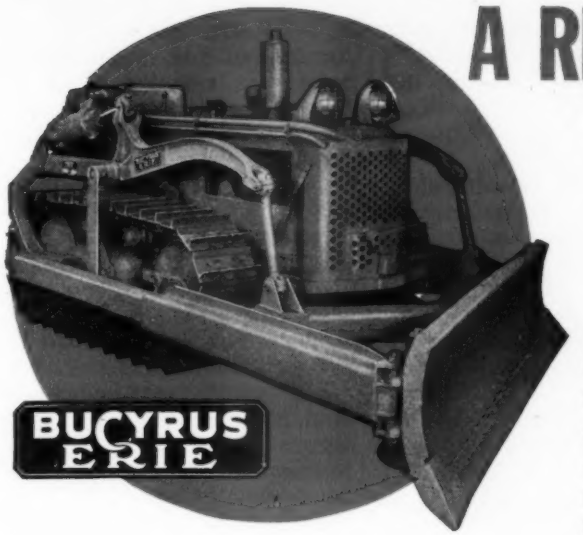
Heavy Duty
Machinery Trailers

Full & Semi Models

5 to 75
Tons Capacity

LACROSSE TRAILER & EQUIPMENT CO.

Lacrosse Wisconsin



A REAL DIGGING TOOL THAT'S EASY ON THE TRACTOR

Bucyrus-Erie Bullgrader-International TracTracTor combinations are powerful, economical dirt-moving teams—powerful because the Bullgrader applies the power of this tractor most efficiently; economical because the Bullgrader safeguards the tractor from undue wear and maintenance. Here are the specific reasons why every Bullgrader, designed and built exclusively for International TracTracTors, permits its owner to take full advantage of tractor power; here are reasons, too, why maintenance is so low:

1 ORIGINAL TRACTOR BALANCE IS MAINTAINED

The Bullgrader is mounted to the TracTracTor in such a way that its balance point is not affected. This enables the tractor to do the work for which it is designed, lets it travel both forward and backward without tipping. It means that you get the full tractive effort of the track belt. Track roller loads are distributed evenly. Excessive wear and strain on front track idlers and rollers is eliminated.

2 LOADS ARE APPLIED AT THE PLACES DESIGNED TO TAKE THEM

The main frame of the Bullgrader is attached to the tractor at the point of rotation of the tractor tracks, so that digging thrusts are carried directly to pivots on the rear support brackets. All superstructures are mounted on the track frame, relieving the tractor main frame, engine, transmission case, final drive housing, etc., of damaging stress and shock loads.

Let your International TracTracTor Distributor show you these features. Be sure to ask him about other Bullgrader features, too: hydraulic control that gives you positive digging down pressure, scientifically curved blade, quick angling and tilting, unobstructed vision.

13T48C

BUCYRUS-ERIE COMPANY

SO. MILWAUKEE
WISCONSIN

See Your
INTERNATIONAL TRACTRACTOR DISTRIBUTOR

Field Notes

(Continued from page 141)

tion of the sample, which may result in damage to the structure of the clay. Nor by hand methods can several samples be taken at the same horizon.

It is worth noting that this multiple sampler can readily be adapted for taking samples from the standard Proctor Mold. This facilitates tests on re-compacted soil and soil compacted to pre-determined densities. All that is required is to thread the top of the Proctor Mold externally with a four-inch diameter thread so that the compacted sample can be extruded into the one-and one-half-inch diameter sample tubes.

The author is indebted to Soil Mechanics, Ltd., and to John Mowlem and Co., Ltd., for permission to publish these details and the photographs reproduced herewith.

Reprint from The Engineer

Air Compressor Lubrication

One of the most important items of air compressor maintenance is the proper servicing of the intake air filters. It is recommended that air cleaners be serviced at least once every eight hours when working under extremely dusty conditions.

Safety Hint

Do not mix alcohol with diesel fuel under any circumstance.

Helping Nature

(Continued from page 132)

modern contractor, do more on less energy than any glacier that ever operated.

In September, 1938, hurricane cloudbursts washed away such large sections of streamside track on the Manchester-Keene line that reconstruction was not undertaken. Busses and trucks had become cheaper carriers. The line was abandoned. Rails and ties were taken up on the half-mile embankment at Keene.

The Manchester-Keene line of the Boston and Maine Railroad was no longer useful so Arthur Whitcomb of Keene has torn it down and trucked it off for local fills, until no more than 300 feet of it is left. Ten thousand five hundred cu. yds. of this embankment was recently loaded into trucks by a new Bucyrus-Erie ¾-cu. yd. shovel, and spread by a Bucyrus-Erie bulldozer on an International TD-9 tractor, to level the grounds of the Keene brush handle plant of the Pittsburgh Plate Glass Company. The job took about ten days. And so, for one spell, this tiny patch of earth long harried by glacier and man, has settled to rest.

For many years, since 1931, Arthur Whitcomb had done a large earth-moving business. His business grew and he had more equipment than any contractor in New Hampshire. His work was largely on roads, dams, and airports, and while the yardages were not large compared to the big projects in other parts of the country, the total reached considerable proportions.

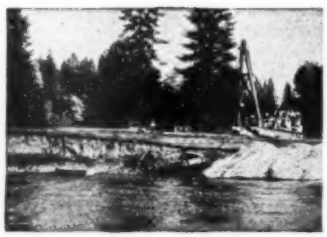
When war came, Whitcomb's equipment included 13 shovels, mostly Bucyrus-Erie 20-Bs with crane, dragline and trench hoe attachments; Caterpillar tractors with LaPlant-Choate bulldozers; a fleet of International dump trucks, and two truck-mounted ½-cu. yd. shovels, a truck-mounted crane, a truck-mounted compressor, and an eight-ton Sterling truck hauling a 35-ton Rogers equipment trailer.

During the war Whitcomb kept his equipment in working order, despite shortage of parts and repairmen. Wilson welders, together with a machine shop for rebuilding worn-out parts, made this maintenance job successful. At present he has on order one 38-B 1½-cu. yd., one 15-B ½-cu. yd., and eight 22-B ¾-cu. yd. Bucyrus-Erie shovels; two TD-9, one ID-9, and one TD-14 International tractors with Bucyrus-Erie bulldozers; two Huber Maintainers; four International K-8 dump trucks; one CH&E roller, and other equipment.

The Whitcomb business is soon going to move into larger quarters. He has just built a large and beautifully fitted house.

The Whitcomb war work included mining of feldspar and mica. He was the first person to mine feldspar with power equip-

CUT COST OF DIG-AND-HAUL JOBS



(View at Left) Sauerman Slackline Cableway in distance is digging sand and gravel from river while small Sauerman Scrapers in foreground handle stockpiles at central mixing plant, on large concrete dam project. (View at Right) Sauerman Scraper machine, with skid-mounted hoist, moves along bank of river, building a sloping revetment with gravel it drags from bars in midstream.

A sure way to economize on many long range material-handling jobs is to use a Sauerman Scraper or Cableway. You can reach across a pit, pond, river or stockpile or up to the top of a hill, move material from any point within the radius of the operating cables and dump the material automatically wherever desired along the line of operation.

Sauerman machines are the product of more than 35 years of specialized experience in designing this type of equipment. Whether your problem is the handling of a few cubic yards or many thousand cubic yards per day, we can give you a size and type of machine economically suited to your requirements—a long-lasting, dependable unit, operated by one man. Sauerman engineers will be glad to study your material-handling problems and offer suggestions.

SAUERMAN BROS. INC., 574 S. Clinton St., Chicago 7, Ill.

SAUERMAN
Long Range Machines

ment and was one of the largest producers of mica in New England. He also built Government access roads to mines and timber lots. In this work he had the assistance of G. Allen Mott, general manager, and a loyal operating crew and office force. Mr. Whitcomb flies his own Stimson plane, which proves a great help in inspecting his jobs, and in keeping in touch with airport construction.

Whitcomb also operates the only washed sand and gravel plant in the Keene area with new, modern equipment capable of handling 100 tons of processed aggregate an hour. In conjunction with the gravel plant he also makes cement blocks and has a Warren hot asphalt plant. His newest venture will be transit mixed concrete, a plant with a capacity of 75 cu. yds. per hour which will be erected this spring. Because of the comparatively small population he can serve, plant production will be regulated by four transit mix trucks but until he can get these trucks he will get along with two used three cu. yd. Ransome mixers mounted on White trucks. About June he hopes to have delivered two new Ransome mixers on Mack trucks to augment his present equipment.

Basing Bids

(Continued from page 136)

tractors have failed to verify the approximate estimates before computing bids. And, in the absence of exceptional circumstances, they have been denied recovery for loss resulting from error, which would have been disclosed by a proper check.

In other words, a contractor may act at his peril by failing to verify approximate estimates, especially where by the terms of his contract he is required to state he has done so. And, as illustrations of the loss possibilities in situations of this kind, the cases reviewed are of force and value.

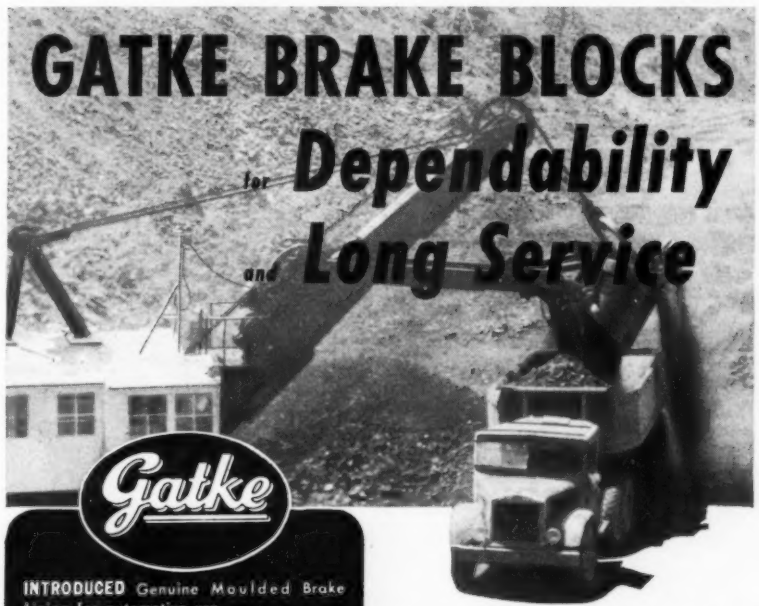
Flood Control

(Continued from page 127)

tion to the channel, the work called for the construction of four railroad bridges—two for the Pacific Electric and two for the Santa Fe. Also, five highway bridges were constructed. Money for these highway bridges was allotted from county funds.

The entire project has an extremely high safety rating, with but one man killed and no serious injuries to date. In the case of the single fatality, a truck driver left his machine in gear, and when he stepped on the starter, the truck backed up, crushing a working man standing in the rear.

At maximum employment, only 562 men were employed on the upper job. The work was practically all machine work, except for some hand labor in the placing of the rock. In fact, one of the major problems was the placing of the stone, since it was not a hand-placed job, but an equipment-placed one. The contractors experimented considerably, and finally settled on the Owens type rock grapple, or bucket. It places stone more nearly the way required, and leaves a minimum amount of hand labor to complete the work. At first skips were tried, but this method was found to re-



INTRODUCED Genuine Moulded Brake Lining for automotive use.

ORIGINATED Wire-Back Moulded Brake Block.

DEVELOPED the first patentable automotive brake lining.

PIONEERED CUSTOM-BILT Brake Lining Sets.

LED the development of Brake Blocks for Trucks, Trailers and Buses.

CHAMPIONED the correct balance between liners of primary and secondary shoes as essential to maximum brake efficiency.

INVENTED Grooved DURA-BLOK Brake Lining.

PERFECTED the Simplified Brake Survey System for Fleet Operators.

To haul *MORE, FASTER, in LESS TIME* you need the extra performance of GATKE *CUSTOM-BILT* Brake Blocks—

They give *smooth, non-grabbing* action with plenty of power for emergency stops—

Stand the heat and hold on long grades or prolonged service—

Wear resistance keeps equipment operating with minimum adjustment.

MAKE THIS TEST. Use GATKE *CUSTOM-BILT* Brake Blocks for your next five relines and compare results with the best you ever had.

Ask your GATKE Jobber or write us for particulars.

Gatke CUSTOM-BILT BRAKE LININGS

BLOCKS SETS ROLLS SHEETS

GATKE CORPORATION

228 N. La Salle St., Chicago 1, Ill.

NOT in the *Contract*

Wife: "Will you love me if I grow fat?"

Hubby: "No; I promised for better or worse, not through thick and thin."

Lawyer (to gorgeous witness): "Answer me, Yes or No!"

Witness: "My, you're a fast worker, aren't you?"

"Where did you get that girl—buck teeth, cross - eyed, bow-legged, stringy-haired . . .?"

"You needn't whisper, pal. She's deaf, too."

The nurse entered the professor's room and said softly: "It's a boy, sir."

The professor looked up, "Well, what does he want?"

"What! You mean to say this man choked a woman to death in a night club in front of 200 people, and nobody interfered?"

"That's right, Judge. Everybody thought they were dancing."

Proprietor of Mountain Hotel (to newly arrived guest) — This is your room, sir. If you want a fine view of the mountains, put a dime in the slot and the shutters open for five minutes.

Two Hollywood kids were talking as they walked home from school. "I've got two little brothers and one little sister," boasted one. "How many do you have?"

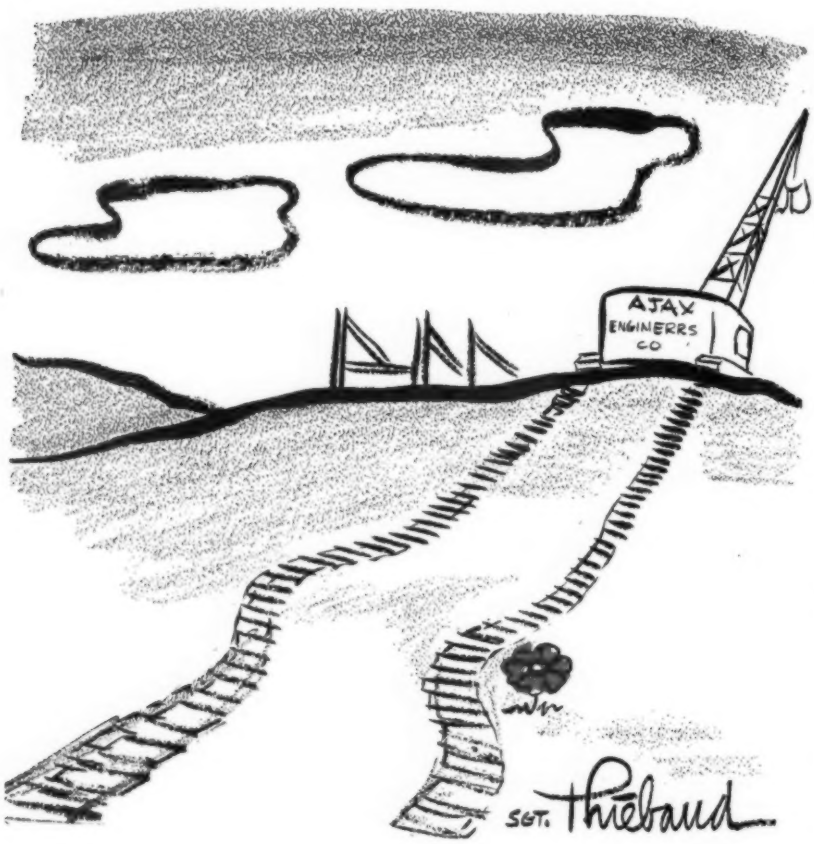
"I don't have any brothers and sisters," answered the second lad, "but I have three papas by my first mama and four mamas by my last papa!"

Gert: "And then he and I talked about the weather."

Flirt: "About the weather?"

Gert: "Yeah. Whether to, or whether not to."

An insurance paper states that for every man 85 years old there are seven women — but it's too late then.



If one looks closely it will be discovered that those who talk loudest about offering one an opportunity are merely fishing for suckers who are always on the lookout for a chance to make money without working for it.

She: Where did you learn to kiss like that?

He: I eat spaghetti.

A fellow who had lost his wallet received this letter: "Sir: I foun yor mony. Remorz is nawing me, so ahm sendin sum of it bak. When it naws me again, I will sen sum more."

"You are the lucky father of quintuplets."

"My gosh," he muttered hoarsely, "I can hardly believe my own census."

"I'm losing my punch," she said, as she left the cocktail party in a hurry.

Father, "Why were you kissing my daughter in that dark corner last night?"

Youth: "Now that I've seen her in daylight I sort of wonder myself."

A girl was asked to parse the word "kiss" and this was her result: This word is a noun, but it is usually used as a conjunction. It is never declined and is more common than proper. It is not very singular, in that it is generally used in the plural. It agrees with me.

"Is that girl's dress torn or am I seeing things?"

"Both."

Boy: "What is meant by a man attending a convention as a delegate-at-large?"

Boy's Father: "It means that his wife didn't go along with him."

Captain: "Have you cleaned the deck and polished the brass?"

Sailor: "Yes, sir, and I've swept the horizon with my telescope."

quire too much hand labor to place the rock in final position.

The concrete channel was constructed from Foothill Boulevard generally along the West Branch of Lytle Creek at a point about one mile upstream from where Warm Creek flows into the Santa Ana River. The East Branch of Lytle Creek will act as a bypass for flows in excess of the capacity of the new concrete channel. These excess flows will be diverted to the East Branch over a concrete spillway 1,000 ft. long. In all, the concrete channel will be nearly 15,000 ft. long, and will have a safe capacity of 30,000 cu. ft. per second, with freeboard allowance and allowance for superelevation.

To accelerate the speed of the water entering the channel, a concrete intake structure 450 ft. long, and tapering in width from 212 to 40 ft., and dropping 22 ft. in elevation, has been constructed. The intake has a steel Taintor gate—25 ft. high and 60 ft. wide—to regulate the flow to channel capacity, and to allow excess flows to be bypassed, by means of the spillway, into the East Branch. The outlet at the downstream end of the concrete channel at Warm Creek is equipped with a bucket section, with a steel sheet pile cutoff and derrick stone scour protection.

Of the total of $8,807,000 being spent from public funds for this flood control project, the state of California has appropriated $752,000. The remaining $8,055,000 is being furnished by the Federal Government.

The second contract—for the construction of the Lytle Creek concrete channel, intake, and outlet structures—was awarded to the Bressi & Bevanda Constructors of Los Angeles, and the Macco Construction Company of Clearwater, California. They worked together as a unit, under the name of Bressi-Bevanda-Macco Company. This latter contract is in the sum of $2,528,350. Including steel and supply contracts to the extent of approximately $3,090,983, this runs the total up into a venture of the first magnitude.

Personnel working on the project, besides the local engineers, include: J. G. Morgan, resident engineer; Loy G. Stover, associate engineer and assistant engineer in charge; R. M. Rigney, assistant resident engineer on the channel construction. In charge of the construction of levees were Alvin L. Saunders, assistant resident engineer, and Beattie C. Hedrick, office engineer and assistant to Saunders. J. S. Mankiewicz was the administrative assistant, and had a clerical staff of seven persons. Also, more than 50 persons were included on the technical force.

The men supervising the operations of the contractors on the first contract are: B. L. Rickards, superintendent, assisted by Leonard Jones as excavating superintendent, and O. T. Bekken as office manager. On the second project, Roscoe P. Downs is project manager, Al Erickson is general superintendent, and Harry Porter is chief engineer.

In the Spotlight!

Outstanding performance always wins recognition and acceptance . . . In the field of Wire Rope, "HERCULES" (Red Strand) long ago won its place "In The Spotlight" because of its uniform reliability and economy in every industry that calls for "heavy duty" action.

You won't go wrong when you adopt the Red-Strand as your buying guide for wire rope. As "HERCULES" is furnished in both Round Strand and Flattened Strand construction, and in either the Preformed or Non-Preformed type — you are assured of adaptability as well as of high quality.

Ask our Engineering Department to recommend the type and construction best suited to your needs.

MADE ONLY BY

A. LESCHEN & SONS ROPE CO.

WIRE ROPE MAKERS
5909 KENNERLY AVENUE

ESTABLISHED 1857
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NEW YORK 6 . . . . 90 West Street
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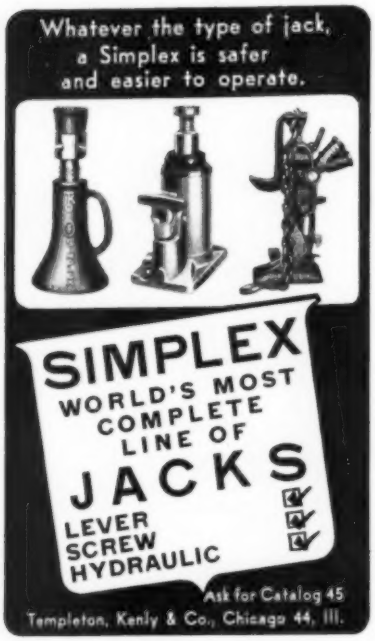
SEATTLE 4 . . . . 3410 First Avenue South

Notes from the manufacturers

Worthington Pump & Machinery Corporation, Newark, N. J., announces the assignment of Paul La France, recently released from the U. S. Navy where he was a Lt. Commander, as a sales engineer for the construction equipment division. His headquarters will be in Washington, D. C.

American Hoist & Derrick Co., of St. Paul, Minn., announces the election of following officers: Frederic Crosby, chairman of board and executive committee; Harold O. Washburn, president; Stanley M. Hunter, vice president of sales; Donal B. Botkin, vice president of manufacturing; James F. Bishop, secretary and treasurer, and Robert J. Henry, assistant secretary. The following were elected directors: Botkin, Pierce Butler, Jr., Crosby, Donald D. Davis, Hunter, Howard S. Johnson, Phillip L. Ray, Carl Schabtach, Washburn, Edwin White, and Jessel S. Whyte.



Union Wire Rope Corp. announces the return of Ray G. Noble, former Kansas University basketball star, to his old duties of advertising manager after three years service with the U. S. Army. Noble had been with Union Wire Rope five years before he entered the armed service.

The Osgood Company and General Excavator, Marion, Ohio, has returned Lt. Robert Maynard to his position of export manager. Recently discharged from the Navy after three years service, Maynard will handle all export sales and advertising.

R. G. LeTourneau, Inc., Peoria, Ill., now has 57 distributors in its domestic sales organization. G. S. McKenty is sales manager.

General Tire and Rubber Co., Akron, Ohio, is planning a big celebration in connection with its 30th anniversary in the tire business, next April. The company started as the Western Tire & Rubber Company of Kansas City in 1909.

Gar Wood Industries, Inc., Detroit, announces the election of Edward Boehm, vice-president and treasurer, to fill a vacancy on the board of directors. Mr. Boehm, also a director of General Instrument Corp., joined Gar Wood in 1942 after many years in the investment banking business in New York.

The Wellman Engineering Co., Cleveland, Ohio, states that W. C. Swalley was elected vice-president in charge of sales. A. J. Lichtinger, vice-president, was elected a member of the board of directors.

Ohio Department of Highways is represented by T. Dye Barnhouse of Marietta as administrative assistant to Perry T. Ford, state highway director. He succeeds G. M. Gerhart who is returning to the American Rolling Mill Co.

Pennsylvania Salt Mfg. Co., through President Leonard T. Beale, appointed James McWhirter, superintendent of Pennsalt's Natrona plant. He succeeds Charles G. Boone who retired last summer.

R. H. Sheppard Co., Inc., Hanover, Pa., announces the return of Fred D. Livingston as sales manager after a three years' leave of absence to accept a Navy commission.

Templeton, Kenly & Co., Chicago, states that following his release from the Naval Air Force, Eugene T. Scott has joined the company as product application engineer with headquarters in Chicago.

LaPlant-Choate Mfg. Co., Inc., Cedar Rapids, Iowa, has named E. R. Galvin, formerly president of Tyson Bearing Corporation of Massillon, Ohio, executive vice-president, general sales manager, and member of the board of directors. He assumed his new duties at LaPlant-Choate on March 1. Galvin was formerly sales manager of R. G. LeTourneau and prior to that was sales manager of Caterpillar Tractor Co. He had also been sales manager of Cleveland Tractor Co. and of the smokeless powder division of E. I. duPont de Nemours & Co.

New trade literature

Title: **Contractor's Pump Manual**
Subject: Designed to supply information on portable pump and guidance to pump users in the construction, mining, industrial and other fields. Based on the experience of manufacturers regarding the characteristics of several types of portable pumps,

"Harcote 20" Rockwell C Hardness 15-25
"Harcote 35" Rockwell C Hardness 30-40
"Harcote 45" Rockwell C Hardness 40-50
"Harcote 55" Rockwell C Hardness 50-60

NOW! **P&H Hard-Facing Electrodes To Match Desired Rockwell "C" Hardness**

P&H now makes hard surfacing a simpler, easier job — *easier* in the selection of the correct electrode . . . *easier* to get the desired as-welded hardness.

These four *new* P&H "Harcote" Electrodes do it! For now Harcote is available in a type having the exact degree of Rockwell C hardness for the job. If the job calls for a Rockwell C hardness of 55 — just order and use Harcote "55". That's all there is to it! No guesswork — no confusion. Simply specify "Harcote" according to the corresponding number of Rockwell "C" hardness desired.

SAVE TIME — SAVE EQUIPMENT — USE P&H HARCOTE

Call Your P&H Representative or write for complete information on Harcote. A complete line of other P&H electrodes is also available.

P&H
HARNISCHFEGER CORPORATION
WELDING ELECTRODES • MOTORS • HOISTS • ELECTRIC CRANES • ARC WELDERS • EXCAVATORS

General Offices:
4517 W. National Ave., Milwaukee 14, Wis.

the manual discusses the selection of the proper kind and size of pump for the particular water-moving job at hand, and the correct operation of the pump, together with its maintenance and repair. Four types of portable pumps are presented — self-priming centrifugal; diaphragms; well-point, and road pumps. In each case the particular advantages and limitations are outlined. "Pump Trouble Check Sheet" is included in the manual, together with a maintenance timetable, a list of operation "Do's and Dont's," tables of useful engineering information and necessary friction tables.

Where to Get: Construction Foundation, Associated General Contractors of America, Munsey Building, Washington 4, D. C. (50c.)

Title: **General Excavator Specifications Bulletin on Type 10, Model 105**

Subject: Included in the two-color folder describing the General Excavator ½-cu. yd. self-propelling rubber-tired excavator is a series of detailed descriptions covering power flow, construction and operation. A fast-moving photographic technique, large pictures with brief factual text, graphically portrays the Type 10's features and advantages.

Where to Get: General Excavator Co., Marion, Ohio (Free).

Title: **LeTourneau Lubrication Chart**

Subject: Especially prepared for service and maintenance men. A new wall chart, 17x22 inches, is now available. It is designed to hang in field office, shop wall or wherever convenient for easy reference. Photographs show lubrication points on every piece of LeTourneau equipment. The chart tells what kind of lubricant to use and how often.

Where to Get: R. G. LeTourneau, Inc., Peoria, Ill. (Free)

Title: **Lubrication and Maintenance Guide for Contractors' Equipment**

Subject: This second edition, like the first, makes no effort to include recommendations for individual pieces of equipment by make and model so that there is not unnecessary duplication. Instead, recommendations are made for the various power and other units found in any given type of equipment. Among subjects covered are: engine lubrication, care of air cleaners, oil filters, care of cooling system, wire rope, crawler mechanism, composite tractor lubrication chart, care of tires, etc.

Where to Get: Gulf Oil Corporation, 3800 Gulf Bldg., Pittsburgh 30, Pa. (Free)

Title: **Athey PD-10 Trailer**

Subject: A giant broadside describing Athey Products Corporation's new PD-10 rubber-tired trailer. Tells the complete story of the new trailer, illustrated with photographs and diagrams. Shows design features, applications and specifications.

Where to Get: Athey Products Corporation 5631 W. 65 St., Chicago 38, Ill. (Free)

Title: **Marlow Mud Hog**

Subject: New bulletin describing power-driven diaphragm pumps available in three and four-inch single and four-inch double sizes, with capacities from 3,000 to 9,000 gallons per hour.

Where to Get: Marlow Pumps, Ridgewood, N. J. (Free)

Title: **1946 Ohio Touring Road Map**

Subject: First Ohio road maps printed since outbreak of war. Map is 25" x 22" and is printed in four colors. The state's 18,443 miles of state highways are scaled on the map 10 miles to an inch. All roads three lanes or more wide (30 or more feet) are designated by an extra line along the regular road line and location of conservation parks are marked in red. Cities insetted on the map are Columbus, Dayton, Toledo, Akron, Cleveland, Youngstown, and Cincinnati.

Where to Get: State of Ohio, Department of Highways, Columbus, Ohio (Free)

Title: **Hobart Arc Welding Electrodes**

Subject: Strip folder announcing complete line of arc welding electrodes. This handy pocket size folder furnishes description, application, procedure, physical properties of deposited metal, and sizes available for each type electrode in this new post-war line.

Where to Get: The Hobart Brothers Company, Troy, Ohio (Free)

Title: **"How to Detect and Correct Pavement Slab Pumping"**

Subject: A booklet intended to familiarize maintenance men with the early recognizable signs of slab pumping, describing a listed and established method that will stop slab pumping once it is recognized.

Where to Get: Koehring Company, Milwaukee 10, Wis. (Free)

HELP WANTED

Design Engineers. Fully experienced in the primary design of heavy construction machinery, such as, shovels, bulldozers, carry scrapers, road rollers, motor graders, asphalt mixers, crushing plant, tractor winches and hydraulic control equipment; wanted for leading South African machinery manufacturing concern. State fullest details, present salary, past experience, age and whether married. Give reference. Permanent position with future.
Box 9257

POSITIONS WANTED

Can operate any kind of shovel, dragline, crane or clamshell—steam, diesel, gas or electric. Can do own repair work. Experienced in quarry, ore and coal stripping. Prefer quarry or coal stripping. Familiar with grading work. Will go anywhere. Have release. Box 9254

OVER 25 YEARS
A BUILDER OF
BUCKETS
Thousands of these
ERIE 2-LINE CLAMSHELLS
serve today on All Fronts
You'll like this sturdy Erie 2-line clamshell that combines block and tackle plus leverage to achieve the greatest digging power for its weight ever designed in this type of bucket. Available in 11 standard sizes from ¼ yd. thru 2½ yd. Write for bulletin 28-1552. Let's have your bucket problem.
Address: 463 Geist Rd.
ERIE STEEL CONSTRUCTION CO.
ERIE, PENNSYLVANIA
Aggre Meters • Buckets • Concrete Plants • Traveling Cranes

TO ADVERTISE: All advertising in this section is payable in advance. Rate: 60c per line, or $7.20 per inch of 12 lines. Minimum charge $2.40. No discounts; no commissions. If no change in copy is desired, three continuous insertions are offered for the price of two. Read these instructions carefully. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Count your own copy to save delay. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January issue closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

SMALL SHOVELS, CRANES AND DRAGLINES UP TO 1½ YDS.

Standard model Marion 32 electric two-belt rigid crawling traction revolving shovel complete with 1½ yard rock bucket, also approximately 400 feet old electric cable and approximately 400 feet of almost new electric cable. This shovel is in very good operating condition. Box 3141.

¾-yd. Shovel dragline—almost new.
1¾-yd. Bucyrus 43-B dragline.
3-yd. Page dragline—90 ft. boom.
7-yd. Continental Scoop—"40" Bulldozer.
Box 3139.

SURPLUS—FOR SALE

IN MISSOURI

P & H "400" Combination Shovel and Dragline

IN WISCONSIN

At Our Portage Plant

Two 8-10 Yards Crawler Wagon Bottom Dump

One Shovel Front for Northwest 104-105

Manley Sand Company
Rockton, Ill.

Marion ¾-yd. Shovel—Clam—Dragline. New guarantee.
Northwest 1¼-yd. shovel, dragline. Rebuilt.
Diesel 3-yd. dragline, 115' boom. Excellent condition. Box 3135.

Bucyrus 50-B steam shovel on cats. Operating condition. F. M. Holl, Phone: 133, Jasonville, Indiana.

1—Lorain 75-B gasoline shovel in excellent condition. Located Virginia.
1—Bucyrus-Erie 37-B, 11,000 series, gasoline shovel, completely reconditioned except caterpillars. Located West Virginia.

Bemiss Equipment Corporation
2219 Chamberlayne Avenue
Richmond, Virginia

MISCELLANEOUS EQUIPT.

Electric shovels, 3 and 4 yd., 4 belt crawlers.
Monighan 3 yd. and Page 2 yd. walker draglines.
Diesel draglines on trucks, 100' booms, 2-3 yd. buckets.
Fairleads for Link-Belt K-55.
Drag Scrapers and slacklines, from ¾ yd.
200 Amp. portable welder, gas and Elec. power.
20 H. P. 4 cyl. gas motor, 1200 speed, no clutch.
Clam. and dragline buckets, ¾ to 8 yds.
Athey Mobiloader, for Cat. RD8 or D8.
Cat. RD7 Angledozer, with down pressure.
WANTED—1½ yd. gas shovel; 1½-2 yd. electric shovel.
Also your offers of any good used equipment.

James Wood
53 West Jackson
Chicago 4, Ill.

For Sale—

SHASTA DAM SAND AND GRAVEL PLANT EQUIPMENT

Including—
GOODYEAR 36" SPECIAL-MAKE BELTING FROM 10-MILE CONVEYOR
16,000' of Belt Remaining
With Idlers, Pulleys and Drives

ALSO—
Electric Motors, Line Equipment, Transformers and Supplies
Pendulum Boom 42" Belt Conveyors, 100' and 200'
Merrick Feedoweights and Weightometers
Dorr Hydroseparator, 20' x 4'
Marcy Rod Mill, 8' x 12'
Vibrating Screens
Trestle and Tripper
Dorr Rake and Bowl Classifiers
Gravel Washer: Extra-heavy Blade Mill
Pumps: Centrifugal, Deep-well, Steam, Dredge
Auxiliary Equipment: Chain Hoists, Winches, Welding Machines, etc.

Subject to Prior Sale

Write, Wire, Telephone Redding 1440

COLUMBIA CONSTRUCTION CO., Inc.
Box 579 Redding, California

Wisconsin motor model B-2, size—5¼ x 6½, 4 cyl. OK for Koehring 301 Dragline. Wisconsin motor, model L—size 4¼ x 5, 4 cyl. OK for Koehring 251 Dragline. These motors have just been completely overhauled and are in excellent condition.

P. K. Duvall & Co.
Logan, Ia.

1—Link-Belt, 25-ton steam locomotive crane, 8 wheels, equipped with 50' boom, outriggers and double drums for clamshell work, air brakes, new flues in boiler, and in A-1 condition, located Norfolk, Virginia.

Bemiss Equipment Corporation
2219 Chamberlayne Avenue
Richmond, Virginia

Wagon Drill: Ingersoll-Rand, Model B, complete with hoist, X71 Drifter and Air Receiver. Good condition. $750 f.o.b. Mankato, Minnesota.

McCree & Company
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For Sale
Equipment Trailers

1—40 Ton Sixteen Wheels

1—25 Ton Eight Wheels

1—20 Ton Eight Wheels

HUGHES – TRAILERS

1029 Brooke Blvd.
Reading, Pennsylvania
Phone Reading — 6417 or 31559

½ yd. Shovel front and backhoe for Byers Model 60. Good condition.

Blazer-Jenkins Concrete Co.
Gallipolis, Ohio
Phone 862-R

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916 Cedar Rapids crusher, like new, and 110' Sullivan air compressor. Both for $1500.00.

J. W. Bartels
45 Edgar Ave.
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SURPLUS DIPPERS FOR BUCYRUS-ERIE SHOVELS

2—¾ cu. yd. Skimmer Scoop Dipper—10-B.
2—½ cu. yd. Drag Shovel Dipper—17-B.
3—½ cu. yd. Skimmer Scoop Dipper—17-B.
1—¾ cu. yd. Welded Dipper—21-B.
1—1¼ cu. yd. Drag Shovel Dipper—88-B.
1—1½ cu. yd. Heavy Duty All Cast Dipper—42-B.
1—1½ cu. yd. type 4 Med. Duty Dipper.
1—2 cu. yd. Rock Dipper—75-B.
1—2¼ cu. yd. Inserted Type Dipper—50-B.
1—2½ cu. yd. Inserted Type—55-B.
1—3½ cu. yd. Coal Loading Dipper—75-B.
1—4 cu. yd. Type IV Medium Duty Dipper—100-B.

F.O.B. Works

Write for any further information desired.

BUCYRUS-ERIE COMPANY
Parts Department
South Milwaukee Wisconsin

Welding and Cutting Outfits, Torches, Regulators and Gauges, for heavy, medium, and light welding and cutting.

Superior Oxy-Acetylene Co.,
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One 1½ yd. Blaw-Knox Clamshell Bucket
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One 1 yd. Keisler Clamshell Bucket
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One 1 yd. Bay City Dragline Bucket
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One 1½ yd. Bucyrus-Erie Shovel Front, Chain Crowd, with 1½ yd. Amsco dipper.
Two Bucyrus-Erie Double Drum Power Winches for D8 or similar size tractor.
Box 3134

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4 or 5 yd. Electric Quarry Shovel. Also will buy or rent a 1½ to 2 yd. dragline. Box 3136.

½-yd. Shovel; ¾-yd. Shovel; 1½-yd. Shovel-Dragline; 2-yd. Dragline; 3 to 5-yd. Dragline; and six 5-yd. Dump trucks. Box 3140.

Wanted: Steam Whirley in good condition for mounting on barge. Must handle 3-yd. bucket and have 100 ft. boom. Give price and full specifications. Box 3137

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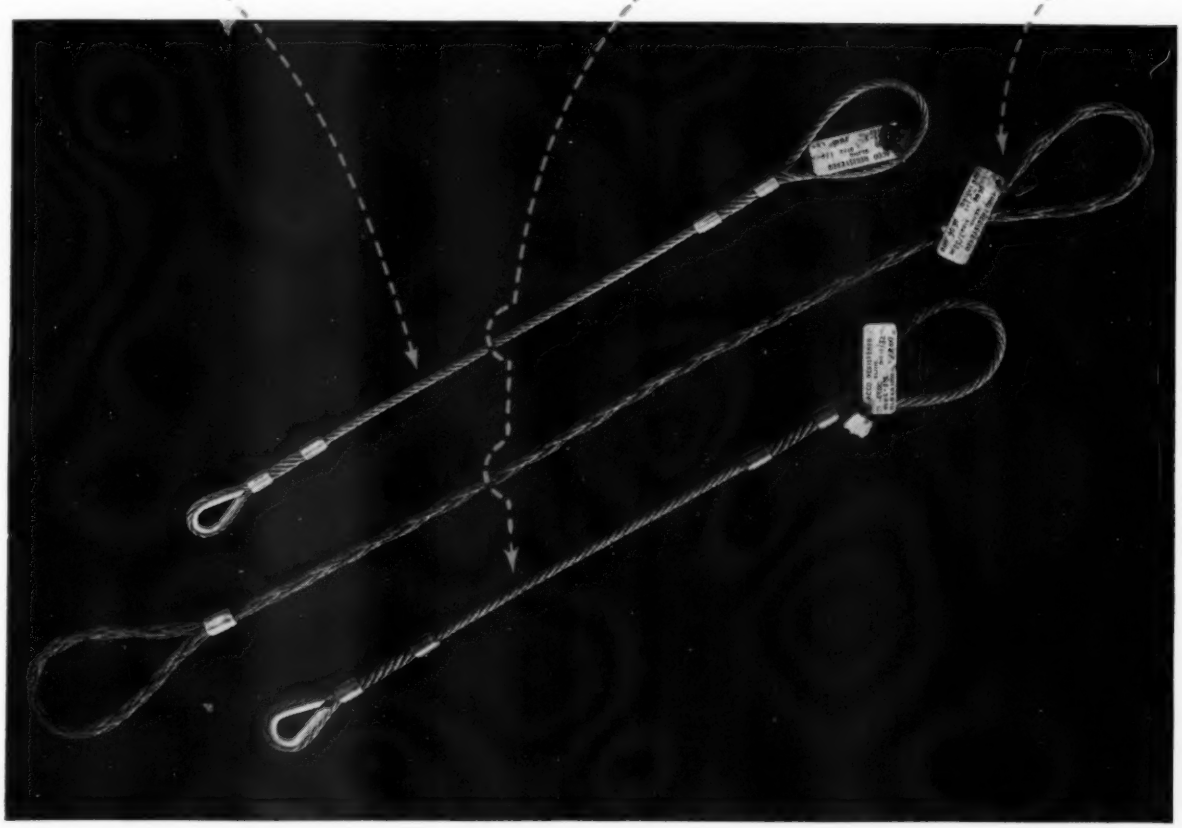
Strand-Laid? Cable-Laid? Braided?



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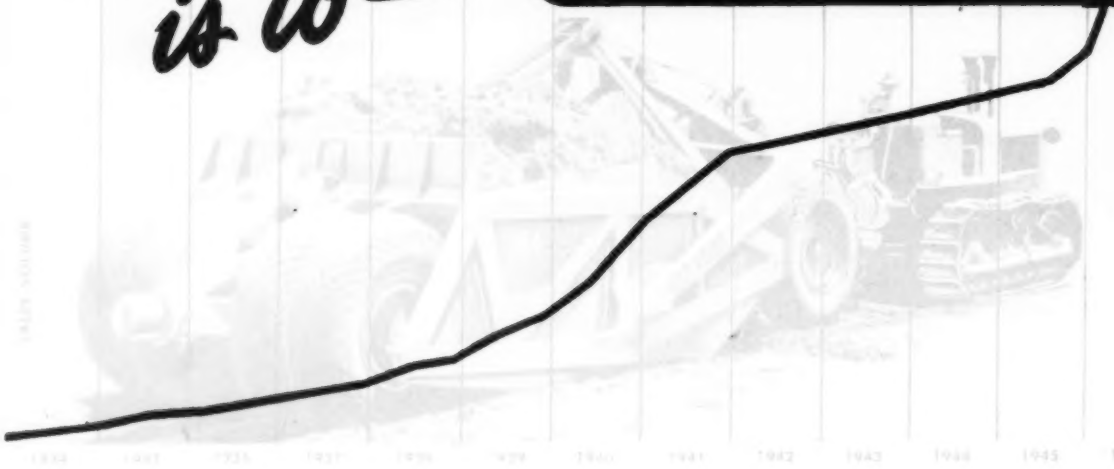
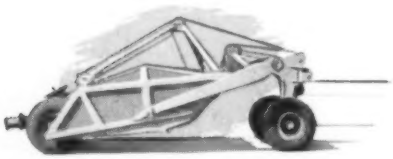
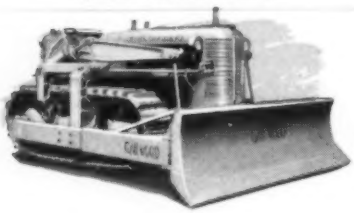
WITH ALLIS-CHALMERS DIESEL POWER





4-WHEEL CABLE SCRAPERS
Capacities: 11-15-20-25 cu. yds.



HYDRAULIC DOZECASTERS with angling blades, for all Allis-Chalmers Tractors

CABLE DOZE-CASTERS with angling blades, for Allis-Chalmers HD-10, HD-14 and HD-14C Tractors

On every kind of earth moving job, throughout the world, Gar Wood Road Machinery has made good, setting new high standards of performance and workmanship.

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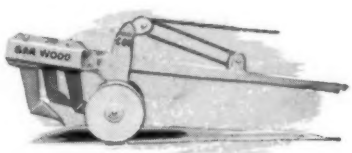
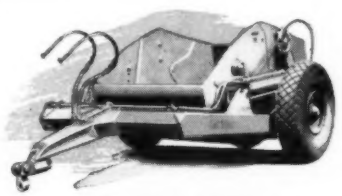
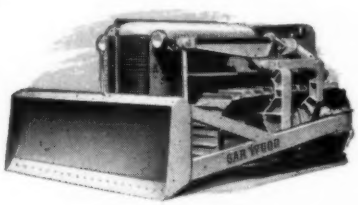
Contact your Allis-Chalmers dealer. Let him point out the superior features of Gar Wood Road Machinery and show you actual job performance in your territory with many satisfied users.



HEAVY DUTY RIPPERS
Cable and hydraulically operated



2-WHEEL HYDRAULIC SCRAPERS
Capacities: 3-5-6-8 cu. yds.



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